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Columbia University in the City of New York

ENTRANCE EXAMINATIONS

1902

FOR ADMISSION TO

COLUMBIA COLLEGE

BARNARD COLLEGE

TEACHERS COLLEGE (Collegiate Course)

SCHOOLS OF APPLIED SCIENCE

COLUMBIA COLLEGE is a College for men, offering a course of four years leading to the degree of Bachelor of Arts.

BARNARD COLLEGE is a College for women, offering a course of four years leading to the degree of Bachelor of Arts.

TEACHERS COLLEGE is a Professional School for Teachers, offering, besides its strictly professional courses, a two-year collegiate course introductory to them. This course is conducted from the teacher's point of view, and, if followed by a two-year professional course, leads to the degree of Bachelor of Science.

THE SCHOOLS OF APPLIED SCIENCE comprise The School of Mines, The School of Chemistry, The School of Engineering, and The School of Architecture, and offer courses of study, each of four years, leading to an appropriate professional degree, in Mining Engineering, Metallurgy, Analytical and Applied Chemistry, Civil, Sanitary, Electrical, and Mechanical Engineering, and Architecture.

Columbia University Bulletins of Information

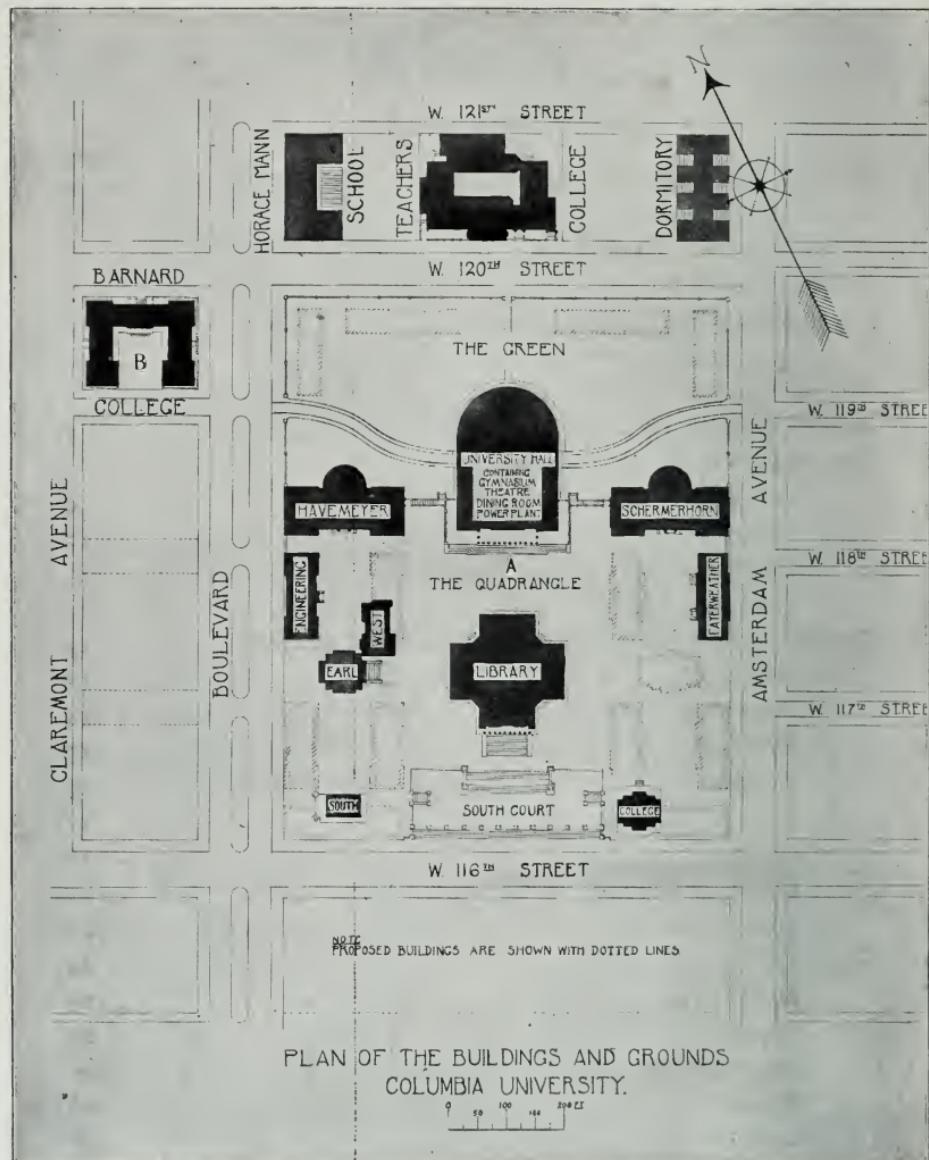
(Issued 25 times during the Academic year, monthly in November and December, and weekly between February and June).

These include:

1. The President's Annual Report to the Trustees.
2. The Catalogue of the University, issued in December, price 25 cents.
3. The Announcements of the several Colleges and Schools and of certain Departments, issued in the Spring and relating to the work of the next year. These are made as accurate as possible, but the right is reserved to make changes in detail as circumstances require. The current number of any of these Announcements will be sent without charge upon application to the Secretary of the University.

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A—Entrance to University Gymnasium.
B—Entrance to Barnard College Theatre.

ENTRANCE EXAMINATIONS

GENERAL STATEMENT

There are no examinations for admission to the Schools of Law, Medicine, Political Science, Philosophy, and Pure Science, or for admission to the graduate courses under the Faculties of Applied Science and Teachers College. For the requirements for admission to these departments see the separate announcements of the Schools and Faculties concerned.

Examinations for admission to Columbia College, Barnard College, Teachers College (Collegiate Course), and the Schools of Applied Science are held twice each year, beginning on the Monday following the second Wednesday in June and on the last Monday in September. In 1902 they will begin on June 16th and September 29th, respectively.

In June, 1902, the entrance examinations of Columbia University will be those of the College Entrance Examination Board of which Columbia University is a member. The examinations in

Advanced Greek,
Advanced History,
Advanced Latin,
Advanced Physics,
Zoölogy,

in which subjects no examinations are at present held by the College Entrance Examination Board, will, however, be conducted by the Columbia University Committee on Entrance Examinations. *Candidates desiring to be examined in any of the above named subjects must file a special application for such examination with the Columbia University Committee on Entrance Examinations at least two weeks before the day on which the entrance examinations begin.*

In September, 1902, the entrance examinations of Columbia University will be conducted by the Columbia University Committee on Entrance Examinations and will be held only at the University. The College Entrance Examination Board at present holds no examinations in September.

APPLICATION FOR EXAMINATION

Every candidate for examination is required to file an application for examination.

For the examinations in June, 1902, the application must be filed with the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y. Applications for examination in New England, in the Middle States, or in Maryland, must be filed on or before June 9. Applications for examination elsewhere in the United States or in Canada must be filed on or before June 2. Applications for examination in Europe must be filed on or before May 19. Requests for blank forms of application should be addressed to the Secretary of the College Entrance Examination Board and should be accompanied by return postage.

For the examinations in September, 1902, candidates for admission to Columbia College or the Schools of Applied Science should send their applications by mail to the Registrar of Columbia University; candidates for admission to Barnard College should send their applications to the Registrar of Barnard College; and for Teachers College, to the Registrar of Teachers College. Applications must be filed on or before September 22d. Requests for blank forms of application should be addressed to the Assistant Secretary of Columbia University.

EXAMINATION FEE

Every candidate for examination is required in each year in which he takes examinations to pay an examination fee of \$5.00.

Every application for examination in June must be accompanied by this fee in the form of a postal order, express order, or draft on New York, to the order of the *College Entrance Examination Board*.*

Every application for examination in September must be accompanied either by the fee in the form of a postal order, express order, or draft on New York, to the order of *Columbia University* or by the receipt issued by the Secretary of the College Entrance Examination Board for the June examinations of the same year.

In every case a candidate who has paid the examination fee will be furnished with a receipt. This receipt should be carefully preserved. It must be presented by the candidate to the Supervisor in charge of the examinations which he attends as evidence that he is entitled to be admitted to the same.

DIVISION OF EXAMINATION

A candidate may take examinations in June (but not in September) of the year preceding that in which he proposes to enter the University. Such examinations are known as preliminary examinations. At his preliminary examinations a candidate may, with the approval of his principal instructor, offer any subject or numbered part of a subject (see Definitions of Requirements below).

In the year in which he purposed to enter the University, a candidate may divide his examinations between June and September in whatever

* An examination fee paid to the College Entrance Examination Board for admission to the June examinations does not cover the matriculation fee of Columbia University.

manner he may wish, and he may offer again in September any subject in which he may have failed at the June examinations.

The results of an entrance examination are allowed to stand to the credit of a candidate for eighteen months, but not longer.

PLACES OF EXAMINATION

In June, 1902, entrance examinations will be held at a large number of widely distributed points. A complete list of the places of examination may be obtained from the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

In September, 1902, examinations for admission to Columbia University will be held only at the University.

EXAMINATION SUBJECTS

Columbia University recognizes the following examination subjects, which may be offered for admission to one or more of the colleges and schools included in the University, each subject counting for a specific number of points as indicated below:

English.....	3	Advanced History.....	1
Elementary History.....	1	" Mathematics.....	1
" Mathematics.....	3	" Latin.....	1
" Latin.....	4	" Greek.....	1
" Greek.....	3	" Physics.....	1
" French.....	2	Botany.....	1
" German.....	2	Chemistry.....	1
" Spanish.....	2	Drawing.....	1
" Physics.....	1	Physiography.....	1
Intermediate French.....	1	Zoölogy.....	1
" German.....	1		

For a statement as to the combinations of subjects which may be offered by candidates for admission to the several colleges and schools see pages 9-12.

TIME-SCHEME OF EXAMINATIONS

In both June and September, 1902, entrance examinations will be conducted at Columbia University. Examinations for men will be held in the Columbia University Gymnasium; and for women, in the Barnard College Theatre. (See plan on page 4.)

Candidates taking these examinations must report to the Supervisor, in the examination room, fifteen minutes in advance of the first examination which they are to attend.

Scheme of Examinations in 1902

Monday, June 16th and September 29th

Algebra.....	9.15-11.45
German, Elementary.....	1- 2.45
Physics, Elementary.....	3- 4.30
French, Advanced.....	4.30- 6

Tuesday, June 17th and September 30th

Geometry.....	9.15-11.45
French, Elementary.....	1- 2.45
Chemistry.....	3- 4.30
German, Advanced.....	4.30- 6
Spanish.....	4.30- 6

Wednesday, June 18th and October 1st

Latin, Elementary (Grammar, Composition I, Cicero).....	9.15-11.15
Latin, Elementary (Sight Translation).....	11.15-12.15
History, Elementary.....	1.30- 4
German, Intermediate.....	4.15- 6

Thursday, June 19th and October 2d

Greek, Elementary (Grammar, Composition I, Ana-basis, Sight Translation).....	9.15-11.45
Drawing.....	10- 11.45
Latin, Elementary (Vergil's <i>Aeneid</i> , Composition II).....	1- 3
French, Intermediate.....	3.30- 5.15

Friday, June 20th and October 3d

English.....	9.15-11.45
Greek, Elementary (Homer's <i>Iliad</i> , Composition II).....	1- 3
Trigonometry.....	3.30- 5.30

Saturday, June 21st and October 4th

Botany.....	9.15-10.45
Greek, Advanced.....	9.15-11.15
History, Advanced.....	9.15-11.15
Physiography.....	11.-12.30
Latin, Advanced.....	11.30- 1.30
Physics, Advanced.....	11.30- 1.30
Zoölogy.....	1.30- 3

TO ENTER COLUMBIA COLLEGE

Total requirement.....15 points

The candidate *must* offer

English (page 25)	counting	3	points
Elementary Mathematics (page 24)	"	3	"

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary Latin (page 24)	counting	4	points
Elementary Greek (page 21)	"	3	"
Elementary History (page 22)	"	1	point
Intermediate French (page 17)	"	1	"
Intermediate German (page 20)	"	1	"
Advanced History (page 22)	"	1	"
Advanced Mathematics (page 25)	"	1	"
Advanced Latin (page 24)	"	1	"
Advanced Greek (page 21)	"	1	"
Advanced Physics (page 25)	"	1	"

The candidate may offer not more than 4 points in all from the three subjects following:

Elementary French (page 17)	counting	2	points
Elementary German (page 19)	"	2	"
Spanish (page 26)	"	2	"

The candidate may offer not more than 2 points in all from the five subjects following:

Elementary Physics (page 25)	counting	1	point
Chemistry (page 14)	"	1	"
Botany (page 13)	"	1	"
Physiography (page 26)	"	1	"
Zoölogy (page 27)	"	1	"

NOTE.—Candidates wishing to fulfil in six years the requirements both for the degree of A.B. and for a degree from one of the Schools of Applied Science are advised to offer, in addition to English and Elementary Mathematics, the following subjects, although other combinations of subjects may readily be made to effect the same end:

Elementary Latin (page 24)	counting	4	points
Elementary German (page 19)	"	2	"
Elementary French (page 17)	"	2	"
Advanced Mathematics (page 25)	"	1	point

TO ENTER BARNARD COLLEGE

Total requirement. 15 points

The candidate *must* offer

English (page 15).....	counting 3 points
Elementary Latin (page 24).....	" 4 "
Elementary Mathematics (page 24)....	" 3 "

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary Greek (page 21).....	counting 3 points
Elementary History (page 22).....	" 1 point
Intermediate French (page 17).....	" 1 "
Intermediate German (page 20).....	" 1 "
Advanced History (page 22).....	" 1 "
Advanced Mathematics (page 25).....	" 1 "
Advanced Latin (page 24).....	" 1 "
Advanced Greek (page 21).....	" 1 "
Advanced Physics (page 25).....	" 1 "

The candidate may offer not more than 4 points in all from the three subjects following:

Elementary French (page 17).....	counting 2 points
Elementary German (page 19).....	" 2 "
Spanish (page 26).....	" 2 "

The candidate may offer not more than 2 points in all from the five subjects following:

Elementary Physics (page 25).....	counting 1 point
Chemistry (page 14).....	" 1 "
Botany (page 13).....	" 1 "
Physiography (page 26).....	" 1 "
Zoölogy (page 27).....	" 1 "

M

, who has been my pupil during the school years..., desires to attend the approaching examinations of the Board. I hereby certify that his (or her) application for examination is made with my approval.

Signature.....

Name of School.....

Date.....

Address of School.....

CERTIFICATE OF GOOD MORAL CHARACTER

This certificate need be submitted only in the year in which the candidate purposes entering college.

I am personally acquainted with the candidate mentioned above, and I hereby certify that he (or she) is a person of good moral character.

Signature.....

Date.....

Address.

Candidate's age on July 1, 1902, will be..... years..... months.....

Place of preparatory study (name of last institution attended, if any).....

Name and address of principal (or of chief teacher).....

Examination fee of \$5.00 must accompany this application. Is it remitted by postal order, express order, or draft on New York, or in currency by registered mail?.....

The examinations which the candidate intends to take must be indicated on the back of this blank.

Extract from Instructions to Candidates for Examination.

“ Each application for examination must be accompanied by the examination fee of \$5.00, for which a receipt will be issued by the Secretary of the College Entrance Examination Board. This fee may be remitted by postal order, express order, or draft on New York to the order of the **College Entrance Examination Board**. This fee must be paid by all applicants whether they intend to present themselves for examination in one subject or in several subjects. The receipt for this payment is to be presented by each candidate to the supervisor in charge of the examination which he attends, as evidence that he is entitled to be admitted to the same.

“ In no case will the fee of a candidate be returned after June 9, 1902.”
“ A candidate presenting himself for examination in two or more successive years, will be required to pay the examination fee of \$5.00 in each year.”

[NOT TO BE FILLED IN BY THE CANDIDATE]

Receipt No. issued.....

Examination fee received.....

<i>a.</i> Virgil, <i>Aeneid</i> , I-VI	<i>b.</i> Advanced Algebra
<i>e.</i> Nepos	<i>i.</i> Series
<i>f.</i> Sallust	<i>ii.</i> Theory of Equations
<i>g.</i> Ovid	<i>c.</i> Plane Geometry
<i>h.</i> Virgil: <i>Elegues</i> and <i>Georgics</i>	<i>d.</i> Solid Geometry
<i>i.</i> Virgil, <i>Aeneid</i> , VII-XII	<i>e.</i> Trigonometry
<i>k.</i> Cicero: <i>De Amicitia</i> and <i>De Senectute</i>	<i>i.</i> Plane
<i>l.</i> Advanced Composition	<i>ii.</i> Spherical
<i>m.</i> Sight Translation	 Physics
 Greek	
<i>a.</i> i. Grammar	 Chemistry
ii. Composition	 Botany
<i>b.</i> Xenophon	 Geography
<i>c.</i> Homer, <i>Iliad</i> , I-III	 Drawing
<i>d.</i> Homer, <i>Iliad</i> , VI-VIII	
<i>e.</i> Herodotus	
<i>f.</i> Advanced Composition	
<i>g.</i> Sight Translation	

College Entrance Examination Board

(Name of candidate)

will offer the following subjects at the examinations in June, 1902.

A check mark is to be placed in the column opposite each subject offered

English

History

a. Reading

German

- a. Elementary
- b. Intermediate
- c. Advanced .

a. i. Grammar

Mathematics

a. Elementary Algebra

College Entrance Examination Board

OVER

APPLICATION FOR EXAMINATION IN 1902

Applications for examination in New England, in the Middle States, or in Maryland, must be filed on or before June 9. Applications for examination elsewhere in the United States or in Canada must be filed on or before June 2. Applications for examination in Europe must be filed on or before May 19. All applications must be addressed to the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

The candidate, or his teacher, is requested to write, as legibly as possible, the information called for by this blank.

Full name of candidate

Residence (street, city, state)

Place where candidate will attend examinations

Address to which report of examinations is to be mailed

Name of college (or university) and of department (or school) of the same, which candidate purposes entering

College Entrance Examination Board

CERTIFICATE FOR TRANSMISSION TO COLLEGE OF CANDIDATE'S CHOICE

This blank must not be detached by the candidate. It need not be filled out if candidate does not expect to go to college, or if college is not yet selected.

Full name of candidate _____

Residence (street, city, state) _____

Name of college (or university) and of department (or school) of the same, which candidate purposes entering _____

Calendar year in which candidate purposes entering college _____

Candidate's age on July 1, 1902, will be _____ years _____ months _____ days.

If the institution which the candidate desires to enter requires special testimonials of scholarship or character in addition to those indicated below, they should be forwarded directly to that institution.

TO ENTER TEACHERS COLLEGE

(Collegiate Course—leading to degree of B.S.)

Total requirement.....15 points

The candidate *must* offer

English (page 15).....counting 3 points
Elementary Mathematics (page 24)....." 3 "

and 9 points from the subjects following, of which four must be in foreign languages:

Elementary French (page 17).....	counting 2 points
Elementary German (page 19).....	" 2 "
Elementary Latin (page 24).....	" 4 "
Elementary Greek (page 21).....	" 3 "
Elementary History (page 22).....	" 1 point
Elementary Physics (page 25).....	" 1 "
Botany (page 13).....	" 1 "
Chemistry (page 14).....	" 1 "
Drawing (page 15).....	" 1 "
Physiography (page 26).....	" 1 "
Zoölogy (page 27).....	" 1 "
Spanish (page 26).....	" 2 points
Intermediate French (page 17).....	" 1 point
Intermediate German (page 20).....	" 1 "
Advanced History (page 22).....	" 1 "
Advanced Mathematics (page 25).....	" 1 "
Advanced Latin (page 24).....	" 1 "
Advanced Greek (page 21).....	" 1 "
Advanced Physics (page 25).....	" 1 "

NOTE.—Candidates for admission to the regular undergraduate professional courses of Teachers College, leading to the Batchelors, Elementary or Kindergarten Diploma, must

(a) have completed the above-mentioned two years' *Collegiate Course* of Teachers College. This course is especially designed as an introduction to the professional courses of the institution.
Or

(b) be graduates of an approved normal school or teachers' training school. *Or*
(c) have completed the Sophomore year in Columbia College, Barnard College, or some other approved college or institution of equal academic rank.

TO ENTER THE SCHOOLS OF APPLIED SCIENCE

SCHOOL OF MINES
SCHOOL OF CHEMISTRY

SCHOOL OF ENGINEERING
SCHOOL OF ARCHITECTURE

Total requirement.....15 points

The candidate *must* offer

Mathematics, elementary and advanced

(pages 24 and 25).....	counting	4 points
Elementary Physics (page 25).....	"	1 point
Chemistry (page 14).....	"	1 "
Freehand Drawing (page 15).....	"	1 "
English (page 15).....	"	3 points
Elementary History (page 22).....	"	1 point
Elementary German (page 19).....	"	2 points

and 2 points from one of the following subjects:

Elementary French (page 17).....	"	2 "
Spanish (page 26).....	"	2 "
Elementary Latin (page 24).....	"	2 "

NOTE.—Attention is called to the fact that the requirements for the degree of A.B. and for a degree from one of the Schools of Applied Science may both be fulfilled in six years. Candidates wishing to fulfil in this way the requirements for both degrees should first enter Columbia College (see page 19).

DEFINITIONS OF REQUIREMENTS *

(Specimen question papers may be obtained from the Registrar upon application.)

BOTANY† (counting one point)

The candidate should have received training by means of the laboratory method in:

The structure and the more obvious features of the life history of at least ten types among the higher seed plants chosen from the more representative families (e. g., Gramineæ, Liliaceæ, Salicaceæ, Ranunculaceæ, Rosaceæ, Leguminosæ, Cruciferæ, Solanaceæ, Labiatæ, Compositæ). In addition to these, the following types are recommended among the remaining lower groups of plants: pine, *Selaginella*, a fern, a moss (*Polytrichum* or *Fu-naria*), a leafy hepatic, *Marchantia*, a mildew (*Microsphæra*), an agaric, *Vaucheria*, *Spirogyra*, and a protophyte (preferably *Sphærella*).

Physiology. This work should cover the essential facts concerning irritability, photosynthesis, respiration, digestion, growth, and reproduction.

Ecology. The natural history of plants should receive considerable attention, and the behavior of plants toward environmental factors (especially light and moisture), dissemination, cross and close pollination, and the more important structural and physiological characteristics of plant formations (hydrophytes, halophytes, mesophytes, and xerophytes) should be included.

As evidence of proper laboratory training and of satisfactory work, the note-book of the candidate should be submitted *at the time of the examination*. The note-book must bear the endorsement of the teacher, certifying that it is a true record of the candidate's work. Candidates desiring the return of their note-books should apply for them after the examination to the Assistant Secretary of the University. Note-books for the return of which no application is made will be preserved for one year only.

* The several subjects are stated in terms of units; the unit is a course of five periods weekly throughout an academic year of the preparatory school; the subjects are assigned units in accordance with the time required to prepare adequately upon them for college entrance.

† For a more detailed statement of the requirement in Botany the reader is referred to the definitions of the requirements published by the College Entrance Examination Board. Applications for the pamphlet containing these definitions should be addressed to the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

CHEMISTRY (counting one point)

The candidate's preparation in Chemistry should include:

- a. The study of a standard text-book, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws of elementary chemistry.
- b. Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c. Individual laboratory work, comprising at least forty exercises.

The following outline includes only the indispensable things which must be studied in the class-room and laboratory. The material is, for the most part, common to all elementary text-books and laboratory manuals. The order of presentation will naturally be determined by each teacher for himself.

OUTLINE.—The chief physical and chemical characteristics, the preparation, and the recognition of the following elements together with their principal compounds: *oxygen, hydrogen, carbon, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, silicon, potassium, sodium, calcium, magnesium, zinc, copper, mercury, silver, aluminum, lead, tin, iron, manganese, chromium*.

More detailed study should be confined to the italicized *elements* (as such) and to a restricted list of compounds such as: water, hydrochloric acid, carbon-monoxide, carbon-dioxide, oxides of nitrogen, nitric acid, ammonia, sulphur-dioxide, sulphuric acid, hydrogen-sulphide, sodium-hydroxide, ammonium-hydroxide.

Attention should be given to the atmosphere (constitution and relation to animal and vegetable life), flames, acids, bases, salts, oxidation and reduction, crystallization, combining proportions by weight and volume, calculations founded on these and Boyle's and Charles's laws, symbols and nomenclature, atomic theory, atomic weights, valency (in a very elementary way), nascent state, natural grouping of the elements, solution (solvents and solubility of gases and solids and liquids, saturation), strength of acids and bases, conservation and dissipation of energy, chemical energy, electrolysis. Chemical terms should be clearly understood and the pupil should be able to illustrate and apply the ideas they embody. The theoretical topics are not intended to form separate subjects of study, but to be taught only so far as is necessary for the correlation and explanation of the experimental facts.

A list of suitable laboratory experiments is contained in the definitions of the requirements published by the College Entrance Examination Board and may be obtained upon application to the Secretary of the Board, Post-Office Sub-Station 84, New York, N. Y.

LABORATORY NOTE-BOOK.—Every candidate must present *at the time of his examination in chemistry* a note-book in which he has recorded the steps and the results of his laboratory experiments. A candidate who fails to present such a note-book cannot receive credit for the examination. Each note-book must contain an index of the experi-

ments which it describes and must be endorsed by the instructor, the endorsement being written in ink on the inside of the cover. The endorsement must in effect be as follows:

I certify that this note-book is a true and original record of experiments actually performed by in the chemical laboratory of School during the year 19....

Instructor in Chemistry.

DRAWING (counting one point)

A candidate must be able to draw and sketch correctly and with proper shading a simple geometrical figure or a group of geometrical solids, or to sketch a simple piece of machinery or a house with correct construction and accuracy of proportion, with a fair knowledge of the rules of perspective and light and shade as applied in freehand sketching. A candidate must also be able to reproduce from a flat copy with enlargement or reduction in size. For candidates for the School of Architecture, the object to be copied will usually be an ornament—an anthemion or acanthus leaf—or a design of iron scrollwork; for the other Schools of Applied Science, the subject will be chosen from machinery details or geometrical constructions; for Teachers College, from geometrical solids, still life, or simple plant forms.

A candidate who has had a fair amount of training in drawing and wishes to be excused from a formal examination in this subject may at the time of the entrance examinations submit drawings, especially systematic sets of drawings, executed at school. They should be accompanied by a certificate from his teacher to the effect that they are the candidate's own work. If they indicate a satisfactory proficiency, they will be accepted in lieu of the examination. Drawings thus submitted, should be sent to the *Assistant Secretary of Columbia University* at least two weeks before the day on which the examinations begin.

ENGLISH (counting three points)

No applicant will be accepted in English whose work is notably defective in point of spelling, grammar, idiom, punctuation, or division into paragraphs.

1. Reading and composition.—The candidate will be required to present evidence of a general knowledge of the subject-matter of the prescribed books, and to answer simple questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics, to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to show the candidate's power of clear and accurate expression, and will call for only a general knowledge of the substance of the books. In place of a part or the whole of this test, the candidate may present an

exercise book,* properly certified by his instructor, containing compositions or other written work done in connection with the reading of the books.

The candidate is expected to read intelligently *all* the books prescribed. He should read them as he reads other books; he is not expected to know them minutely, but to have freshly in mind their most important parts. In preparation for this part of the requirement, it is important that the candidate shall have been instructed in the fundamental principles of rhetoric.

Candidates offering this part of the requirement as a preliminary subject should be prepared on the books prescribed for the year in which they propose to enter the University.

The books prescribed for this part of the examination are as follows:

In 1902: Shakspere's Merchant of Venice; Pope's Iliad, Books I, IV, XXII, and XXIV; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's Vicar of Wakefield; Coleridge's Ancient Mariner; Scott's Ivanhoe; Cooper's Last of the Mohicans; Tennyson's Princess; Lowell's Vision of Sir Launfal; George Eliot's Silas Marner.

In 1903, 1904, and 1905: Shakspere's Merchant of Venice and Julius Cæsar; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's Vicar of Wakefield; Coleridge's Ancient Mariner; Scott's Ivanhoe; Carlyle's Essay on Burns; Tennyson's Princess; Lowell's Vision of Sir Launfal; George Eliot's Silas Marner.

2. Study and composition.—This part of the examination presupposes the thorough study of each of the works named below. The examination will be upon the subject-matter, the literary form, and the logical structure. The candidate may be required, in addition, to answer questions involving the essentials of English grammar, and questions on the leading facts in those periods of English literary history to which the prescribed works belong.

In connection with the reading and study of the required books, parallel or subsidiary reading should be encouraged, and a considerable amount of English poetry should be committed to memory. The essentials of English grammar should not be neglected in preparatory study.

The books prescribed for this part of the examination are as follows:

In 1902, 1903, 1904, and 1905: Shakspere's Macbeth; Milton's Lycidas, Comus, L'Allegro, and Il Penseroso; Burke's Speech on Conciliation with America; Macaulay's Essays on Milton and Addison.

* Such exercise books should be prepared in accordance with a list of directions, to be obtained by addressing the Assistant Secretary of the University. *Exercise books should be sent to the Assistant Secretary of Columbia University not later than two weeks before the first day of the examinations.* Within ten days the teacher will be informed whether the candidate is, or is not, excused from examination on the books prescribed for reading. Exercise books will not be returned to the writers.

FRENCH

Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course the pupil should be able to pronounce French accurately, to read at sight easy French prose, to put into French simple English sentences taken from the language of everyday life, or based upon a portion of the French text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural of nouns, the inflection of adjectives, participles, and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix in the memory the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practice in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of easy modern prose in the form of stories, plays, or historical or biographical sketches; (2) constant practice, as in the previous year, in translating into French easy variations upon the texts read; (3) frequent abstracts, sometimes oral and sometimes written, of portions of the text already read; (4) writing French from dictation; (5) continued drill upon the rudiments of grammar, with constant application in the construction of sentences; (6) mastery of the forms and use of pronouns, pronominal adjectives, of all but the rare irregular verb forms, and of the simpler uses of the conditional and subjunctive.

Suitable texts for the second year are: About's *Le roi des montagnes*, Bruno's *Le tour de la France*, Daudet's easier short tales, La Bédollière's *La Mère Michel et son chat*, Erckmann-Chatrian's stories, Foa's *Contes biographiques* and *Le petit Robinson de Paris*, Foncin's *Le pays de France*, Labiche and Martin's *La poudre aux yeux* and *Le voyage de M. Perrichon*, Legouvé and Labiche's *La cigale chez les fourmis*, Malbot's *Sans famille*, Mairet's *La tâche du petit Pierre*, Mérimée's *Colomba*, extracts from Michelet, Sarcey's *Le siège de Paris*, Verne's stories.

Intermediate (counting one point)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight ordinary French prose or simple

poetry, to translate into French a connected passage of English based on the text read, and to answer questions involving a more thorough knowledge of syntax than is expected in the elementary course.

THE WORK TO BE DONE.—This should comprise the reading of from 400 to 600 pages of French of ordinary difficulty, a portion to be in the dramatic form; constant practice in giving French paraphrases, abstracts or reproductions from memory of selected portions of the matter read; the study of a grammar of moderate completeness; writing from dictation.

Suitable texts are: About's stories, Augier and Sandeau's *Le gendre de M. Poirier*, Béranger's poems, Corneille's *Le Cid* and *Horace*, Coppée's poems, Daudet's *La Belle-Nivernaise*, La Brète's *Mon oncle et mon curé*, Madame de Sévigné's letters, Hugo's *Hernani* and *La chute*, Labiche's plays, Loti's *Pêcheur d'Islande*, Mignet's historical writings, Molière's *L'avare* and *Le bourgeois gentilhomme*, Racine's *Athalie*, *Andromaque*, and *Esther*, George Sand's plays and stories, Sandeau's *Mademoiselle de la Seiglière*, Scribe's plays, Thierry's *Récits des temps mérovingiens*, Thiers's *L'expédition de Bonaparte en Egypte*, Vigny's *La canne de jonc*, Voltaire's historical writings.

Advanced *

THE AIM OF THE INSTRUCTION.—At the end of the advanced course the pupil should be able to read at sight, with the help of a vocabulary of special technical expressions, difficult French not earlier than that of the seventeenth century; to write in French a short essay on some simple subject connected with the works read; to put into French a passage of easy English prose; and to carry on a simple conversation in French.

THE WORK TO BE DONE.—This should comprise the reading of from 600 to 1000 pages of standard French, classical and modern, only difficult passages being explained in the class; the writing of numerous short themes in French; the study of syntax.

Suitable reading matter will be: Beaumarchais's *Barbier de Séville*; Corneille's dramas; the elder Dumas's prose writings; the younger Dumas's *La question d'argent*; Hugo's *Ruy Blas*, lyrics, and prose writings; La Fontaine's fables; Lamartine's *Graziella*; Marivaux's plays; Molière's plays; Musset's plays and poems; Pellisser's *Mouvement littéraire au XIX^e siècle*; Renan's *Souvenirs d'enfance et de jeunesse*; Rousseau's writings; Sainte-Beuve's essays; Taine's *Origines de la France contemporaine*; Voltaire's writings; selections from Zola, Maupassant, and Balzac.

* Advanced French must be offered by candidates who wish to enter the course French (see courses announced by the Department of Romance Languages and Literatures). It may not be counted among the points required for admission.

GERMAN

Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course in German the pupil should be able to read at sight, and to translate, if called upon, by way of proving his ability to read, a passage of very easy dialogue or narrative prose, help being given upon unusual words and constructions, to put into German short English sentences taken from the language of everyday life or based upon the text given for translation, and to answer questions upon the rudiments of grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill upon pronunciation; (2) the memorizing and frequent repetition of easy colloquial sentences; (3) drill upon the rudiments of grammar—that is, upon the inflection of the articles, of such nouns as belong to the language of everyday life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word-order; (4) abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (5) the reading of from 75 to 100 pages of graduated texts from a reader, with constant practice in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English), and in the reproduction from memory of sentences previously read.

During the second year the work should comprise: (1) the reading of from 150 to 200 pages of literature in the form of easy stories and plays; (2) accompanying practice, as before, in the translation into German of easy variations upon the matter read, and also in the off-hand reproduction, sometimes orally and sometimes in writing, of the substance of short and easy selected passages; (3) continued drill upon the rudiments of the grammar, directed to the ends of enabling the pupil, first, to use his knowledge with facility in the formation of sentences, and, secondly, to state his knowledge correctly in the technical language of grammar.

Stories suitable for the elementary course can be selected from the following list: Andersen's *Märchen* and *Bilderbuch ohne Bilder*; Arnold's *Fritz auf Ferien*; Baumbach's *Die Nonna* and *Der Schwiegersohn*; Gerstäcker's *Germelshausen*; Heyse's *L'Arrabbiata*, *Das Mädchen von Treppi*, and *Anfang und Ende*; Hillern's *Höher als die Kirche*; Jensen's *Die braune Erica*; Leander's *Träumereien*, and *Kleine Geschichten*; Seidel's *Märchen*; Stökl's *Unter dem Christbaum*; Storm's *Immensee* and *Geschichten aus der Tonne*; Zschokke's *Ders zerbrochene Krug*.

Among the shorter plays the best available are perhaps Benedix's *Der Prozess*, *Der Weiberfeind*, and *Günstige Vorzeichen*; Elz's *Er ist nicht eifersüchtig*; Wichert's *An der Majorsecke*; Wilhelm's *Einer muss heiraten*. It is recommended, however, that not more than one

of these plays be read. The narrative style should predominate. A good selection of reading matter for the second year would be Andersen's *Märchen*, or *Bilderbuch*, or Leander's *Träumereien*, to the extent of, say, forty pages. After that such a story as *Das kalte Herz*, or *Der zerbrochene Krug*; then *Höher als die Kirche*, or *Immensee*; next a good story by Heyse, Baumbach, or Seidel; lastly *Der Prozess*.

Intermediate (counting one point)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight German prose of ordinary difficulty, whether recent or classical; to put into German a connected passage of simple English, paraphrased from a given text in German; to answer any grammatical questions relating to usual forms and essential principles of the language, including syntax and word-formation; and to translate and explain (so far as explanation may be necessary) a passage of classical literature taken from some text previously studied.

THE WORK TO BE DONE.—The work should comprise, in addition to the elementary course, the reading of about 400 pages of moderately difficult prose and poetry, with constant practice in giving, sometimes orally and sometimes in writing, paraphrases, abstracts, or reproductions from memory of selected portions of the matter read; also grammatical drill upon the less usual strong verbs, the use of articles, cases, auxiliaries of all kinds, tenses and modes (with special reference to the infinitive and subjunctive), and likewise upon word-order and word-formation.

The intermediate course is supposed to be the elementary course, plus one year's work at the rate of not less than four recitations a week. Suitable reading matter for the third year can be selected from such works as the following: Ebner-Eschenbach's *Die Freiherren von Gemperlein*; Freytag's *Die Journalisten* and *Bilder aus der deutschen Vergangenheit*—for example, *Karl der Grosse*, *Aus den Kreuzzügen*, *Doktor Luiher*, *Aus dem Staat Friedrichs des Grossen*; Fouqué's *Undine*; Gerstäcker's *Irrefahrten*; Goethe's *Hermann und Dorothea* and *Iphigenie*; Heine's poems and *Reisebilder*; Hoffmann's *Historische Erzählungen*; Lessing's *Minna von Barnhelm*; Meyer's *Gustav Adolfs Page*; Moser's *Der Bibliothekar*; Riehl's *Novellen*—for example, *Burg Neideck*, *Der Fluch der Schönheit*, *Der stumme Ratsherr*, *Das Spielmannskind*; Rosegger's *Waldheimat*; Schiller's *Der Nefje als Onkel*, *Der Geisterseher*, *Wilhelm Tell*, *Die Jungfrau von Orleans*, *Das Lied von der Glocke*, *Balladen*; Scheffel's *Der Trompeter von Säckingen*; Uhland's poems; Wildenbruch's *Das edle Blut*.

Advanced *

THE AIM OF THE INSTRUCTION.—At the end of the advanced course the student should be able to read, after brief inspection, any German

* Advanced German should be offered, if possible, by candidates desiring to take advanced courses in German. It may not be counted among the points required for admission.

literature of the last one hundred and fifty years that is free from any unusual textual difficulties, to put into German a passage of simple English prose, to answer in German questions relating to the lives and works of great writers studied, and to write in German a short, independent theme upon some assigned topic.

THE WORK TO BE DONE.—The work of the advanced course (last year) should comprise the reading of about 500 pages of good literature in prose and poetry, reference readings upon the lives and works of the great writers studied, the writing in German of numerous short themes upon assigned subjects, independent translation of English into German.

GREEK

Elementary (counting three points)

1. Greek Grammar.

The common forms, idioms, and constructions, and the general grammatical principles of Attic Greek prose; also the constructions, poetical forms, and prosody of Homer's Iliad.

2. Greek Composition I.

Translation into Greek of detached sentences to test the candidate's knowledge of grammatical constructions.

The examination in the two subjects immediately preceding will be based on the first two books of Xenophon's Anabasis.

3. Xenophon.

The first four books of the Anabasis.

4. Homer.

The first three books of the Iliad (omitting II, 494-end).

5. Greek Composition II.

Translation into Greek of continuous prose based on Xenophon and other Attic prose of similar difficulty.

6. Sight Translation.

Translation into English at sight, based on prose of no greater difficulty than Xenophon's Anabasis.

Advanced (counting one point)

Candidates offering Greek as an advanced subject must present the equivalent of the course known as Greek B (see courses announced by the Department of Greek). In Homer, for which no equivalent will ordinarily be accepted, the minimum requirement will be 1600 lines in addition to the amount offered for the elementary examination. The candidate must also offer the eight orations of Lysias in Morgan's edition, or an equivalent amount of similar Greek, and in prose composition at least twenty exercises in the writing of connected narrative prose. The exercises in Part III of Allinson's Greek Prose Composition will show the grade of preparation demanded.

HISTORY

Elementary (counting one point)

Candidates offering history as an elementary subject may present themselves for examination upon either of the following groups. They will not be permitted to offer both of these groups as elementary subjects.

First Group:

1. Greek history to the death of Alexander, with due reference to Greek life, literature, and art.
2. Roman history to the accession of Commodus, with due reference to literature and government.

In 1903 and thereafter for the subjects of this group will be substituted the following:

1. *Ancient history, including a brief introductory study of the Oriental peoples and early mediæval history to the death of Charlemagne, with due reference to art, literature, and government.*
2. *Mediæval and modern history, with due reference to the growth of the state-system.*

Second Group:

3. English history, with due reference to social and political development.
4. American history, with the elements of civil government.

NOTE.—For preparation in either of these groups a course of study equivalent to at least three lessons a week for two years will be needful. On examination a candidate must show such general knowledge of each field offered as may be acquired from the study of an accurate text-book of not less than three hundred pages. Since, however, the examination will be so framed as to require comparison and the use of judgment rather than mere exercise of memory on the part of the pupil, it is recommended that the teacher prescribe a course of supplementary reading of not less than five hundred pages dealing with the more important periods and events in both of the historical fields offered. Geographical knowledge will be tested by requiring the location of places and movements on an outline map.

Advanced (counting one point)

Any one of the four courses which follow:

1. Greek history to the destruction of Corinth, and Roman history to the death of Constantine. (Open to candidates only who have offered English and American history as an elementary subject.)
2. English and American history. (Open to candidates only who have offered Greek and Roman history as an elementary subject.)
3. European history from the Germanic conquests to the beginning of the seventeenth century.
4. A year's study of any one of the four historical fields defined under Elementary History and not already offered by the candidate, together with a year's detailed study of a limited period within that field, (e. g., the Spartan and Theban supremacies, the

period of the Punic wars, the Stuart period, the transition from the American colonial to the federal system) selected with the approval of the Department of History.

The examination in the second part of 4 will be specially adapted to the particular period selected.

In every case the candidate must show on examination such an acquaintance with the whole field as may be gained from the study of good text-books together with substantial parallel readings, and such a detailed knowledge of some part of the field as may be gained from suitable topical study.

In 1903 and thereafter for the preceding statement relative to the requirement in Advanced History will be substituted the following :

The requirement in Advanced History is intended to be an equivalent for History A—the course prescribed in Columbia College (see courses given by Department of History). The work done at school, therefore, should be substantially identical with that course. Those candidates who have taken the examination in Elementary History, and desire to offer History as an advanced subject, must present themselves for examination upon the historical fields included in THAT GROUP WHICH THEY DID NOT OFFER AS AN ELEMENTARY SUBJECT. For example, if a candidate offers the first group as the elementary subject, he must offer the second group as the advanced subject, and vice versa. The examination will pre-suppose superior ability on the part of the candidate in Advanced History to understand the significance of historical events, movements, or tendencies, to discern similarities and contrasts, and to combine results.

As further evidence of proficiency, satisfactory written work, done at school and duly certified by the teacher as to independent preparation, must be submitted. This work must be presented in the form of a note-book, or bound collection of notes, containing not less than five thousand words on each historical field offered, and must show practice in at least three of the following exercises:

- (a) Notes and digests of reading outside of the text-books.
- (b) Written recitations requiring the use of judgment, and the application to new questions of knowledge already gained.
- (c) Written parallels between historical characters, events, or periods.
- (d) Brief studies of topics limited in scope, prepared outside the class-room and illustrated by some reference to contemporary material.
- (e) Historical maps or charts showing explorations, migrations, conquests, territorial changes, or social phenomena.

The written work must be sent to the Assistant Secretary of Columbia University, two weeks before the entrance examination begins.

LATIN

Elementary (counting four points *)

1. Latin Grammar.

The inflections; the simpler rules for composition and derivation of words; syntax of cases and verbs; structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse and the subjunctive; also so much of prosody as concerns accent, versification in general, and the dactylic hexameter.

2. Latin Composition I.

Translation into Latin of detached sentences and very easy continuous prose based upon Caesar and Cicero.

3. Cicero.

Any six orations from the following list, but preferably the first six mentioned:

The four orations against Catiline, Archias, and the Manilian Law, Marcellus, Roscius, Milo, Sestius, Ligarius, the Fourteenth Philippic.

4. Vergil.

The first six books of the *Aeneid*.

5. Latin Composition II.

Translation into Latin of continuous prose of moderate difficulty based on Cicero.

6. Sight Translation.

Translation into English at sight, based exclusively on prose of no greater difficulty than the easier parts of Cicero's orations.

Advanced (counting one point)

Candidates offering Latin as an advanced subject must present the equivalent of the course known as Latin A (see courses announced by the Department of Latin). This course comprises the reading of Cicero's *De Senectute* and *De Amicitia*, a review of the syntax of the verb as contained in any standard grammar, and a knowledge of prose composition as represented by the second part of Daniells's *New Latin Composition*; also the reading of the first and third books of the *Odes* of Horace, with a satisfactory knowledge of the prosody.

MATHEMATICS

Elementary (counting three points)

1. Algebra to quadratics.

Factors, common divisors, and multiples, fractions, equations of the first degree with one or more unknown quantities, evolution, the doctrine of exponents, radicals, radical equations reducible to equations of the first degree, and putting problems into equations.

* Candidates for admission to Columbia College, Teachers College, or the Schools of Applied Science, who are unable to offer the whole of Elementary Latin will be permitted to offer two points from this subject. Such candidates should offer parts 1, 2, and 3 as indicated above.

2. Algebra from quadratics.

Quadratic equations, equations with one or more unknown quantities that can be solved by the methods of quadratic equations, problems depending upon such equations, ratio and proportion, and the binomial theorem for positive entire exponents.

3. Plane geometry.

Plane geometry, including the solution of simple original exercises and numerical problems.

Advanced (counting one point)

1. Solid geometry.

Solid and spherical geometry, including the solution of simple original exercises and numerical problems.

2. Algebra.

The arithmetical and geometrical progressions, the elementary treatment of permutations and combinations, and the use of four-place and five-place tables of logarithms.

3. Plane trigonometry.

The definitions and relations of the six trigonometrical functions as ratios, proof of important formulæ, theory of logarithms and use of tables, solution of right and oblique plane triangles.

PHYSICS

Elementary (counting one point)

The candidate's preparation in physics should include:

- a. The study of a standard text-book supplemented by the use of many varied numerical problems, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws in elementary physics.
- b. Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c. Individual laboratory work, comprising at least forty exercises distributed about as follows: mechanics 17, sound 3, heat 5, light 6, electricity 9.

A list of suitable experiments in physics is contained in the definitions of the requirements published by the College Entrance Examination Board and may be obtained upon application to the Secretary of the Board, Post-Office Sub-Station 84, New York, N. Y.

LABORATORY NOTE-BOOK.—Every candidate must present *at the time of his examination in physics* a note-book in which he has recorded the steps and the results of his laboratory experiments. A candidate who fails to present such a note-book cannot receive credit for the examination. Each note-book must contain an index of the experiments which it describes and must be endorsed by the instructor,

the endorsement being written in ink on the inside of the cover. The endorsement must in effect be as follows:

I certify that this note-book is a true and original record of experiments actually performed by.....
in the physical laboratory of..... School
during the year 19.....

Instructor in Physics.

Advanced (counting one point)

Candidates offering physics as an advanced subject must have studied physics for a full year after satisfactorily completing the elementary requirement. The work during this time must be devoted to a more thorough and extensive study of the subjects previously covered in a general way. Besides class-work, it must include at least sixty experiments actually performed in the laboratory by the candidate. A laboratory note-book must be submitted at the time of the examination. It must contain a certificate from the teacher that it is a true record of the candidate's work. It will be returned to the candidate upon subsequent application to the Assistant Secretary of the University.

PHYSIOGRAPHY (counting one point)

The equivalent of Davis's Physical Geography, together with an approved laboratory and field course of at least forty exercises actually performed by the candidate.*

The candidate will be required to present at the time of his examination the original note-book in which he recorded, with dates, the steps and results of his laboratory exercises. This book, which should contain an index of subjects, must bear the endorsement of the teacher, certifying that it is a true record of the candidate's work.

SPANISH (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the course the pupil should be able to pronounce Spanish accurately, to read at sight easy Spanish prose, to put into Spanish simple English sentences taken from the language of everyday life, or based upon a portion of the Spanish text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the conjugation of the regular and the more common irregular verbs, the inflection of nouns, adjectives, and pronouns, and the elementary rules of syntax; (3) exercises containing

* For a more detailed statement of the requirement in physiography the reader is referred to the definitions of the requirements published by the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

illustrations of the principles of grammar; (4) the reading and accurate rendering into good English of from 100 to 175 duodecimo pages of graduated texts, with translation into Spanish of easy variations of the sentences read; (5) writing Spanish from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of modern prose from different authors; (2) practice in translating Spanish into English, and English variations of the text into Spanish; (3) continued study of the elements of grammar and syntax; (4) mastery of all but the rare irregular verb forms and of the simpler uses of the moods and tenses; (5) writing Spanish from dictation.

Suitable texts for the second year are: Valera's *El pájaro verde*; Alarcón's *El final de Norma*, *El capitán Veneno*; Valdès's *José*; Galdós's *Doña Perfecta*; Marianela; Parde Isla's version of *Gil Blas*; Carrion and Aza's *Zaragüeta*.

ZOOLOGY (counting one point)

In general, zoölogy is not recommended as an entrance subject unless the study has been preceded or accompanied by that of physics and chemistry, which form the most desirable groundwork for collegiate courses in biology. The entrance examination in zoölogy is designed to test, first, the candidate's practical acquaintance with the natural history, structure, and relationships of some of the leading types of animals, and, second, his knowledge of the more essential facts of physiology.

Practical Zoölogy. A practical examination on at least ten common animal types, and the presentation by the candidate of a laboratory note-book, certified by the teacher, as evidence of a laboratory course actually performed. Examples of the types suggested are the frog, fish, mollusk, insects, crustaceans, annelid, starfish, hydroid (*Hydra*), and protozoan. In the examination less weight is laid on a knowledge of anatomical *minutiae* than on the ability to recognize the specimen and its allies, to indicate its relationships, and to point out the leading features of its life-history, organization, and physiology.

Elementary Physiology. The nature of foods and their history in the body; the essential facts of digestion, absorption, circulation, secretion, excretion, and respiration; the motor, nervous, and sensory functions; and the structure of the various organs by which these operations are performed. Martin's *Human Body* (briefer course) forms a suitable basis for this work; but teachers are recommended as far as possible to correlate the physiology of man and the higher animals with that of the lower forms studied in the course on practical

CIRCULARS OF INFORMATION

For information as to the acceptance of certificates in lieu of examination, admission to advanced standing, regulations regarding special students, tuition fees, scholarships, curriculum, and scheme of attendance, application should be made to the Secretary of the University for such circulars of information as are necessary. The following are distributed without charge:

Announcement of Columbia College

Announcement of Barnard College

Announcement of Teachers College

Circular of General Information, Schools of Applied Science

In connection with the general circular of the Schools of Applied Science, the candidate should ask for the special circular of the particular Course in which he is interested. These circulars show the courses in Mining Engineering, Metallurgy, Chemistry, Civil and Sanitary Engineering, Electrical Engineering, Mechanical Engineering, and Architecture.

For information upon any point not covered by the pamphlets, inquire of the Secretary of Columbia University.

Additional copies of this pamphlet may be obtained upon application. Instructors are requested to furnish the Secretary of the University, at as early a day as possible, with the names and addresses of students to whom the pamphlet should be sent.

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Third Series, No. 3

February 7, 1903



Columbia University Bulletins of Information

ENTRANCE EXAMINATIONS

1903

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

FOR ADMISSION TO

COLUMBIA COLLEGE—a College for men, offering a course of four years leading to the degree of Bachelor of Arts.

BARNARD COLLEGE—a College for women, offering a course of four years leading to the degree of Bachelor of Arts.

TEACHERS COLLEGE (Collegiate Course). Besides its strictly professional courses, Teachers College offers a two-year collegiate course introductory to them. This course is conducted from the teacher's point of view, and, if followed by a two-year professional course, leads to the degree of Bachelor of Science.

THE COLLEGE OF PHYSICIANS AND SURGEONS—the Medical Department of the University, offering a course of four years leading to the degree of Doctor of Medicine.

THE SCHOOLS OF APPLIED SCIENCE—comprising The School of Mines, The School of Chemistry, The School of Engineering, and **THE SCHOOL OF ARCHITECTURE**, which offer courses of study, each of four years, leading to an appropriate professional degree, in Mining, Engineering, Metallurgy, Analytical and Applied Chemistry, Civil, Sanitary, Electrical, and Mechanical Engineering, and Architecture.

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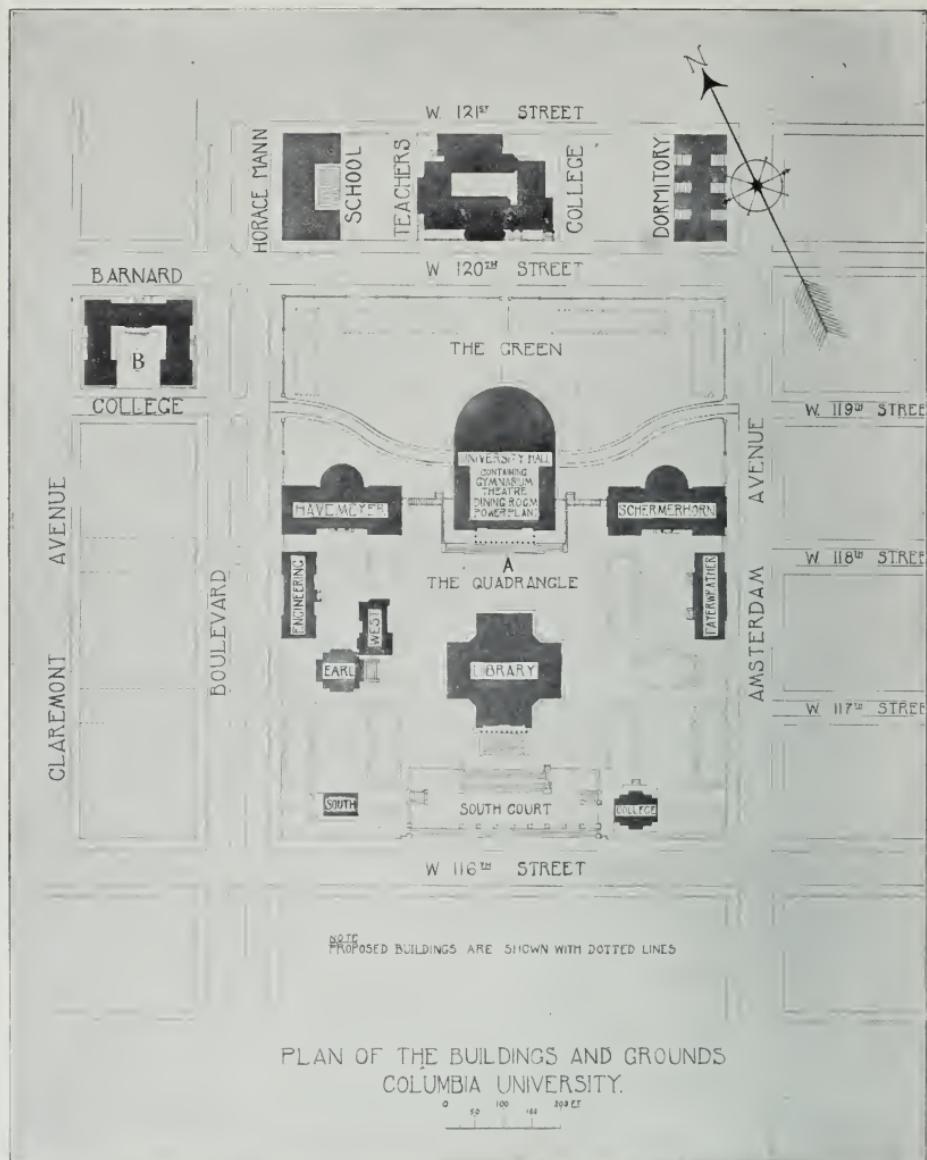
(Issued 25 times during the Academic Year, monthly in November and December, and weekly between February and June. Entered as second-class matter at the New York, N. Y., Post Office, Dec. 22, 1900, under Act of July 16, 1894.)

These include:

1. The President's Annual Report to the Trustees.
2. The Catalogue of the University, issued in December, price 25 cents.
3. The Announcements of the several Colleges and Schools and of certain Departments, issued in the spring, and relating to the work of the next year. These are made as accurate as possible, but the right is reserved to make changes in detail as circumstances require. The current number of any of these Announcements will be sent without charge upon application to the Secretary of the University.

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A—Entrance to University Gymnasium.

B—Entrance to Barnard College Theatre.

ENTRANCE EXAMINATIONS

GENERAL STATEMENT

There are no examinations for admission to the Schools of Law, Political Science, Philosophy, and Pure Science, or for admission to the graduate courses under the Faculties of Applied Science and Architecture and Teachers College. For the requirements for admission to these departments see the separate announcements of the Schools and Faculties concerned.

Examinations for admission to Columbia College, Barnard College, Teachers College (Collegiate Course), the College of Physicians and Surgeons, and the Schools of Applied Science and Architecture are held twice each year, beginning on the Monday following the second Wednesday in June, and in September on the Monday of the week preceding that during which the University opens. In 1903 they will begin on June 15th and September 14th, respectively.

In June, 1903, the entrance examinations of Columbia University will be those of the College Entrance Examination Board, of which Columbia University is a member.

In September, 1903, the entrance examinations of Columbia University will be conducted by the Columbia University Committee on Entrance Examinations and will be held only at the University. The College Entrance Examination Board at present holds no examinations in September.

APPLICATION FOR EXAMINATION

Every candidate for examination is required to file an application for examination.

For the examinations in June, 1903, the application must be filed with the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y. Applications for examination in New England, in the Middle States, or in Maryland, must be filed on or before June 1st. Applications for examination elsewhere in the United States or in Canada must be filed on or before May 25th; and applications for examination in Europe must be filed on or before May 11th. Candidates filing their application later than the dates named do so at their own risk. Requests for blank forms of application should be addressed to the Secretary of the College Entrance Examination Board and should be accompanied by return postage.

For the examinations in September, 1903, candidates for admission to Columbia College, the College of Physicians and Surgeons, or the Schools of Applied Science and Architecture should send their applications by mail to the Registrar of Columbia University; candidates for admission to Barnard College should send their applications to the Registrar of Barnard College; and for Teachers College, to the Registrar of Teachers College. Applications must be filed on or before September 7th. Candidates filing their application later than this date do so at their own risk.

EXAMINATION FEE

Every application for examination in June must be accompanied by a fee of \$5 in the form of a postal order, express order, or draft on New York, to the order of the *College Entrance Examination Board*.

Every application for examination in September must be accompanied either by a fee of \$5 in the form of a postal order, express order, or draft on New York, to the order of *Columbia University*, by a receipt from the Bursar for an examination fee previously paid or by the receipt issued by the Secretary of the College Entrance Examination Board for the June examinations of the same year.

If a late application is accepted either by the College Entrance Examination Board, or by the University Committee on Entrance Examinations, a second fee of \$5 is charged to the candidate making such late application.

As an example of the administration of these examination fees, if a candidate presents himself in June, 1903, for a preliminary examination, and both in June and September, 1904, to complete his work, his total examination fees will be \$10 (\$5 namely for the examinations of each year, paid to the College Entrance Examination Board. These payments do *not* cover the matriculation fee of \$5 which is required of each student on first entering Columbia University). To this amount would have to be added \$5 for each time that either the College Entrance Examination Board or the Columbia University Committee on Entrance Examinations accepted a late application for examination from the candidate.

In every case a candidate who has paid the examination fee will be furnished with a receipt. This receipt should be carefully preserved. It must be presented by the candidate to the Supervisor in charge of the examinations which he attends as evidence that he is entitled to be admitted to the same.

DIVISION OF EXAMINATION

A candidate may take examinations in June (but not in September) of the year preceding that in which he proposes to enter the University. Such examinations are known as preliminary examinations. At his preliminary examinations a candidate may, with the approval of his principal instructor, offer any subject or numbered part of a subject (see Definitions of Requirements below).

In the year in which he purposed to enter the University, a candidate may divide his examinations between June and September in whatever manner he may wish, and he may offer again in September any subject in which he may have failed at the June examinations.

The results of an entrance examination are allowed to stand to the credit of a candidate for eighteen months, but not longer.

PLACES OF EXAMINATION

In June, 1903, entrance examinations will be held at a large number of widely distributed points. A complete list of the places of examination may be obtained from the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

In September, 1903, examinations for admission to Columbia University will be held only at the University.

EXAMINATION SUBJECTS

Columbia University recognizes the following examination subjects, which may be offered for admission to one or more of the colleges and schools included in the University, each subject counting for a specific number of points as indicated below:

English.....	3	Advanced Greek *	I
Elementary French.....	2	" History *.....	I
" German.....	2	" Latin *.....	I
" Greek.....	3	" Mathematics.....	I
" History.....	1	" Physics *.....	I
" Latin.....	4	Botany.....	I
" Mathematics.....	3	Chemistry.....	I
" Physics.....	1	Drawing.....	I
" Spanish.....	2	Physiography.....	I
Intermediate French.....	1	Zoölogy *.....	I
" German.....	1		

For a statement as to the combinations of subjects which may be offered by candidates for admission to the several colleges and schools see pages 8-12.

SCHEDULE OF EXAMINATIONS

In both June and September, 1903, entrance examinations will be conducted at Columbia University. Examinations for men will be held in the Columbia University Gymnasium; and for women, in the Barnard College Theatre. (See plan on page 2.)

Candidates taking these examinations must report to the Supervisor, in the examination room, fifteen minutes in advance of the first examination which they are to attend.

* Candidates will be examined in this subject only in September.

Schedule of Examinations in 1903

Monday, June 15th and September 14th

Mathematics <i>a</i> , <i>i</i> , <i>ii</i> (Elementary Algebra: to Quadratics; Quadratics, etc.)	9-	11
Mathematics <i>a</i> , <i>iii</i> (Advanced Algebra)	11-	12
German <i>a</i> (Elementary German)	1-	2.45
Physics (Elementary)	3-	4.30
French <i>c</i> (Advanced French)	4.30-	6

Tuesday, June 16th and September 15th

Mathematics <i>c</i> , <i>d</i> (Plane Geometry; Solid Geometry)	9.15-	11.45
French <i>a</i> (Elementary French)	1-	2.45
Chemistry	3-	4.30
German <i>c</i> (Advanced German)	4.30-	6
Spanish	4.30-	6

Wednesday, June 17th and September 16th

Latin <i>a</i> (Grammar and Composition)	9-	10
Latin <i>c</i> (Cicero)	10-	11
Latin <i>m</i> (Sight Translation)	11-	12
History <i>a</i> (Ancient History)	1-	3.30
History <i>c</i> (English History)	1-	3.30
Greek History *	1-	3.30
Roman History *	1-	3.30
German <i>b</i> (Intermediate German)	3.45-	5.15

Thursday, June 18th and September 17th

Greek <i>a</i> (Grammar and Composition)	9-	10
Greek <i>b</i> (Xenophon)	10-	11
Greek <i>g</i> (Sight Translation)	11-	12
Drawing	9.30-	12
Latin <i>d</i> (Vergil's <i>Aeneid</i> , Books I-VI)	2-	3
Latin <i>l</i> (Advanced Latin Composition)	3-	4
French <i>b</i> (Intermediate French)	4.15-	5.45

Friday, June 19th and September 18th

English <i>a</i> (Reading and Practice)	9-	10.30
English <i>b</i> (Study and Practice)	10.30-	12
Mathematics <i>e</i> (Trigonometry)	1-	3
Greek <i>c</i> (Homer's <i>Iliad</i> , Books I-III)	3.15-	4.15
Greek <i>f</i> (Advanced Greek Composition)	4.15-	5.15

* Separate examinations in Greek history and Roman history will be held in 1903, for the benefit of candidates who in 1902 took a preliminary examination in one of these subjects.

Thomasville College

Saturday, June 20th and September 19th

History b (Mediaeval and Modern History)	9.30-12
History d (American History)	9.30-12
Botany *	1- 2.30
Physiography *	1- 2.30

The following examinations are given only in September:

Advanced Greek *	1- 2.30
Advanced History *	1- 2.30
Advanced Latin *	1- 2.30
Advanced Physics *	1- 2.30
Zoölogy *	1- 2.30

* If a candidate offers more than one of these subjects, his or her examinations in them are to follow one another immediately and must be completed before he or she is permitted to leave the examination room.

TO ENTER COLUMBIA COLLEGE

Total requirement.....15 points

The candidate *must* offer

English (page 15).....	counting 3 points
Elementary Mathematics (page 24).....	" 3 "

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary Greek (page 21).....	counting 3 points
Elementary History (page 22).....	" 1 point
Elementary Latin (page 23).....	" 4 points
Intermediate French (page 18).....	" 1 point
Intermediate German (page 20).....	" 1 "
Advanced Greek (page 22).....	" 1 "
Advanced History (page 22).....	" 1 "
Advanced Latin (page 24).....	" 1 "
Advanced Mathematics (page 25).....	" 1 "
Advanced Physics (page 26).....	" 1 "

The candidate may offer not more than 4 points in all from the three subjects following:

Elementary French (page 17).....	counting 2 points
Elementary German (page 19).....	" 2 "
Spanish (page 26).....	" 2 "

The candidate may offer not more than 2 points in all from the five subjects following:

Botany (page 13).....	counting 1 point
Chemistry (page 14).....	" 1 "
Elementary Physics (page 25).....	" 1 "
Physiography (page 26).....	" 1 "
Zoölogy (page 27).....	" 1 "

NOTE.—Candidates wishing to fulfil in six years the requirements both for the degree of A.B. and for a degree from one of the Schools of Applied Science are advised to offer, in addition to English and Elementary Mathematics, the following subjects, although other combinations of subjects may readily be made to effect the same end:

Elementary French (page 17).....	counting 2 points
Elementary German (page 19).....	" 2 "
Elementary Latin (page 23).....	" 4 "
Advanced Mathematics (page 25).....	" 1 point

TO ENTER BARNARD COLLEGE

Total requirement.....15 points

The candidate *must* offer

English (page 15)	counting 3 points
Elementary Latin (page 23)	" 4 "
Elementary Mathematics (page 24)	" 3 "

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary Greek (page 21)	counting 3 points
Elementary History (page 22)	" 1 point
Intermediate French (page 18)	" 1 "
Intermediate German (page 20)	" 1 "
Advanced Greek (page 22)	" 1 "
Advanced History (page 22)	" 1 "
Advanced Latin (page 24)	" 1 "
Advanced Mathematics (page 25)	" 1 "
Advanced Physics (page 26)	" 1 "

The candidate may offer not more than 4 points in all from the three subjects following:

Elementary French (page 17)	counting 2 points
Elementary German (page 19)	" 2 "
Spanish (page 26)	" 2 "

The candidate may offer not more than 2 points in all from the five subjects following:

Botany (page 13)	counting 1 point
Chemistry (page 14)	" 1 "
Elementary Physics (page 25)	" 1 "
Physiography (page 26)	" 1 "
Zoölogy (page 27)	" 1 "

TO ENTER TEACHERS COLLEGE

(Collegiate Course—leading to degree of B.S.)

Total requirement. 15 points

The candidate *must* offer

English (page 15) counting 3 points

Elementary Mathematics (page 24) ... " 3 "

and 9 points from the subjects following, of which 4 must be in foreign languages, subject to the restriction that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary French (page 17) counting 2 points

Elementary German (page 19) " 2 "

Elementary Greek (page 21) " 3 "

Elementary History (page 22) " 1 point

Elementary Latin (page 23) " 4 points

Elementary Physics (page 25) " 1 point

Botany (page 13) " 1 "

Chemistry (page 14) " 1 "

Drawing (page 15) " 1 "

Physiography (page 26) " 1 "

Spanish (page 26) " 2 points

Zoölogy (page 27) " 1 point

Intermediate French (page 18) " 1 "

Intermediate German (page 20) " 1 "

Advanced Greek (page 22) " 1 "

Advanced History (page 22) " 1 "

Advanced Latin (page 24) " 1 "

Advanced Mathematics (page 25) " 1 "

Advanced Physics (page 26) " 1 "

NOTE.—Candidates for admission to the regular undergraduate professional courses of Teachers College, leading to the Bachelor's, Elementary, or Kindergarten Diploma, must

(a) have completed the above-mentioned two years' *Collegiate Course* of Teachers College. This course is especially designed as an introduction to the professional courses of the institution. *Or*

(b) be graduates of an approved normal school or teachers' training school. *Or*

(c) have completed the Sophomore year in Columbia College, Barnard College, or some other approved college or institution of equal academic rank.

TO ENTER THE COLLEGE OF PHYSICIANS AND SURGEONS

Total requirement.....15 points

The candidate *must* offer

English (page 15).....	counting 3 points
Elementary French (page 17) { or Elementary German (page 19)}	2 " "
Elementary Latin, <i>a</i> and either <i>b</i> or <i>c</i> or <i>d</i> (page 23).....	2 "
Elementary Mathematics (page 24)....	3 "

and 5 points from the following, subject to the restriction that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary French, if not offered among the 10 required points (page 17).....	" 2 "
Elementary German, if not offered among the 10 required points (page 19).....	" 2 "
Elementary Greek (page 21).....	" 3 "
Elementary History (page 22).....	" 1 point
Elementary Latin, <i>b</i> or <i>c</i> or <i>d</i> , and <i>l</i> and <i>m</i> (page 23).....	" 2 points
Elementary Physics (page 25).....	" 1 point
Botany (page 13).....	" 1 "
Chemistry (page 14).....	" 1 "
Drawing (page 15).....	" 1 "
Physiography (page 26).....	" 1 "
Spanish (page 26).....	" 2 points
Zoölogy (page 27).....	" 1 point
Intermediate French (page 18).....	" 1 "
Intermediate German (page 20).....	" 1 "
Advanced French (page 18).....	" 1 "
Advanced German (page 21).....	" 1 "
Advanced Greek (page 22)	" 1 "
Advanced History (page 22)	" 1 "
Advanced Latin (page 24).....	" 1 "
Advanced Mathematics (page 25)....	" 1 "
Advanced Physics (page 26).....	" 1 "

TO ENTER THE SCHOOLS OF APPLIED SCIENCE AND ARCHITECTURE

SCHOOL OF MINES

SCHOOL OF CHEMISTRY

SCHOOL OF ENGINEERING

SCHOOL OF ARCHITECTURE

Total requirement.....15 points

The candidate *must* offer

Chemistry (page 14).....	counting 1 point
Drawing (page 15).....	" 1 "
English (page 15).....	" 3 points
Elementary German (page 19).....	" 2 "
Elementary History (page 22).....	" 1 point
Elementary Physics (page 25).....	" 1 "
Mathematics, Elementary and Advanced (pages 24 and 25).....	" 4 points
and 2 points from one of the following subjects:	
Elementary French (page 17).....	" 2 "
Elementary Latin (page 23).....	" 2 "
Spanish (page 26).....	" 2 "

NOTE.—Attention is called to the fact that the requirements for the degree of A.B. and for a degree from one of the Schools of Applied Science may both be fulfilled in six years. Candidates wishing to fulfil in this way the requirements for both degrees should first enter Columbia College (see page 8).

DEFINITIONS OF REQUIREMENTS *

(Specimens of the question papers set by Columbia University may be obtained from the Registrar upon application. The question papers set by the College Entrance Examination Board are published in book form by Ginn & Company, Boston, Mass. The volumes for 1901 and 1902 are sold for sixty cents each.)

BOTANY† (counting one point)

The candidate should have received training by means of the laboratory method in:

The structure and the more obvious features of the life history of at least ten types among the higher seed plants chosen from the more representative families (e. g., Gramineæ, Liliaceæ, Salicaceæ, Ranunculaceæ, Rosaceæ, Leguminosæ, Cruciferæ, Solanaceæ, Labiatæ, Compositæ). In addition to these, the following types are recommended among the remaining lower groups of plants: pine, *Selaginella*, a fern, a moss (*Polytrichum* or *Fusaria*), a leafy hepatic, *Marchantia*, a mildew (*Microsphaera*), an agaric, *Vaucheria*, *Spirogyra*, and a protophyte (preferably *Sphaerella*).

Physiology. This work should cover the essential facts concerning irritability, photosynthesis, respiration, digestion, growth, and reproduction.

Ecology. The natural history of plants should receive considerable attention, and the behavior of plants toward environmental factors (especially light and moisture), dissemination, cross and close pollination, and the more important structural and physiological characteristics of plant formations (hydrophytes, halophytes, mesophytes, and xerophytes) should be included.

As evidence of proper laboratory training and of satisfactory work, the note-book of the candidate should be submitted *at the time of the examination*. The note-book must bear the

* The several subjects are stated in terms of units; the unit is a course of five periods weekly throughout an academic year of the preparatory school; the subjects are assigned units in accordance with the time required to prepare adequately upon them for college entrance.

† For a more detailed statement of the requirement in Botany the reader is referred to the definitions of the requirements published by the College Entrance Examination Board. Applications for the pamphlet containing these definitions should be addressed to the Secretary of the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

endorsement of the teacher, certifying that it is a true record of the candidate's work. Candidates desiring the return of their note-books should apply for them after the examination to the Secretary of the University. Note-books for the return of which no application is made will be preserved for one year only.

CHEMISTRY (counting one point)

The candidate's preparation in Chemistry should include:

- a. The study of a standard text-book, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws of elementary chemistry.
- b. Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c. Individual laboratory work, comprising at least forty exercises.

The following outline includes only the indispensable things which must be studied in the class-room and laboratory. The material is, for the most part, common to all elementary text-books and laboratory manuals. The order of presentation will naturally be determined by each teacher for himself.

OUTLINE.—The chief physical and chemical characteristics, the preparation and the recognition of the following elements together with their principal compounds: *oxygen, hydrogen, carbon, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, silicon, potassium, sodium, calcium, magnesium, zinc, copper, mercury, silver, aluminum, lead, tin, iron, manganese, chromium*.

More detailed study should be confined to the italicized *elements* (as such) and to a restricted list of compounds such as: water, hydrochloric acid, carbon-monoxide, carbon-dioxide, oxides of nitrogen, nitric acid, ammonia, sulphur-dioxide, sulphuric acid, hydrogen-sulphide, sodium-hydroxide, ammonium-hydroxide.

Attention should be given to the atmosphere (constitution and relation to animal and vegetable life), flames, acids, bases, salts, oxidation and reduction, crystallization, combining proportions by weight and volume, calculations founded on these and Boyle's and Charles's laws, symbols and nomenclature, atomic theory, atomic weights, valency (in a very elementary way), nascent state, natural grouping of the elements, solution (solvents and solubility of gases and solids and liquids, saturation), strength of acids and bases, conservation and dissipation of energy, chemical energy, electrolysis. Chemical terms should be clearly understood and the pupil should be able to illustrate and apply the ideas they embody. The theoretical topics are not intended to form separate subjects of study, but to be taught only so far as is necessary for the correlation and explanation of the experimental facts.

A list of suitable laboratory experiments is contained in the defi-

nitions of the requirements published by the College Entrance Examination Board and may be obtained upon application to the Secretary of the Board, Post-Office Sub-Station 84, New York, N. Y.

LABORATORY NOTE-BOOK.—Every candidate must present *at the time of his examination in chemistry* a note-book in which he has recorded the steps and the results of his laboratory experiments. A candidate who fails to present such a note-book cannot receive credit for the examination. Each note-book must contain an index of the experiments which it describes and must be endorsed by the instructor, the endorsement being written in ink on the inside of the cover. The endorsement must in effect be as follows:

I certify that this note-book is a true and original record of experiments actually performed by.....
in the chemical laboratory of..... School
during the year 19.....

Instructor in Chemistry.

DRAWING (counting one point)

A candidate must be able to draw and sketch correctly and with proper shading and accuracy of proportion, a simple geometrical figure, a group of geometrical solids or a simple piece of machinery, showing a fair knowledge of the rules of perspective and light and shade as applied in freehand sketching. A candidate must also be able to reproduce from a flat copy with enlargement or reduction in size. For candidates for the School of Architecture, the object to be copied will usually be an ornament—an anthemion or acanthus leaf—or a design of iron scrollwork; for the other Schools of Applied Science, the subject will be chosen from machinery details or geometrical constructions; for Teachers College, from geometrical solids, still life, or simple plant forms.

A candidate who has had a fair amount of training in drawing and wishes to be excused from a formal examination in this subject may at the time of the entrance examinations submit drawings, especially systematic sets of drawings, executed at school. They should be accompanied by a certificate from his teacher to the effect that they are the candidate's own work. If they indicate a satisfactory proficiency, they will be accepted in lieu of the examination. Drawings thus submitted should be sent to the *Secretary of Columbia University* at least two weeks before the day on which the examinations begin.

ENGLISH (counting three points)

No applicant will be accepted in English whose work is notably defective in point of spelling, grammar, idiom, punctuation, or division into paragraphs.

- a. **Reading and practice.**—The candidate will be required to present evidence of a general knowledge of the subject-matter of

the prescribed books, and to answer simple questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics, to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to show the candidate's power of clear and accurate expression, and will call for only a general knowledge of the substance of the books. In place of a part or the whole of this test, the candidate may present an exercise book,* properly certified by his instructor, containing compositions or other written work done in connection with the reading of the books.

The candidate is expected to read intelligently *all* the books prescribed. He should read them as he reads other books; he is not expected to know them minutely, but to have freshly in mind their most important parts. In preparation for this part of the requirement, it is important that the candidate shall have been instructed in the fundamental principles of rhetoric.

Candidates offering this part of the requirement as a preliminary subject should be prepared on the books prescribed for the year in which they propose to enter the University.

The books prescribed for this part of the examination are as follows: In 1903, 1904, and 1905: Shakspere's Merchant of Venice and Julius Cæsar; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's Vicar of Wakefield; Coleridge's Ancient Mariner; Scott's Ivanhoe; Carlyle's Essay on Burns; Tennyson's Princess; Lowell's Vision of Sir Launfal; George Eliot's Silas Marner.

In 1906, 1907, and 1908: Shakspere's Merchant of Venice and Macbeth; The Sir Roger de Coverley Papers in the Spectator; Irving's Life of Goldsmith; Coleridge's Ancient Mariner; Scott's Ivanhoe and The Lady of the Lake; Tennyson's Gareth and Lynette, Launcelot and Elaine, and The Passing of Arthur; Lowell's Vision of Sir Launfal; George Eliot's Silas Marner.

b. Study and practice.—This part of the examination presupposes the thorough study of each of the works named below. The examination will be upon the subject-matter, the literary form, and the logical structure. The candidate may be required, in addition, to answer questions involving the essentials of English grammar, and questions on the leading facts in those periods of English literary history to which the prescribed works belong.

* Such exercise books should be prepared in accordance with a list of directions, to be obtained by addressing the Secretary of the University. *Exercise books should be sent to the Secretary of Columbia University not later than two weeks before the first day of the examinations.* Within ten days the teacher will be informed whether the candidate is, or is not, excused from examination on the books prescribed for reading. Exercise books will not be returned to the writers.

In connection with the reading and study of the required books, parallel or subsidiary reading should be encouraged, and a considerable amount of English poetry should be committed to memory. The essentials of English grammar should not be neglected in preparatory study.

The books prescribed for this part of the examination are as follows:

In 1903, 1904, and 1905: Shakspere's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's Speech on Conciliation with America; Macaulay's Essays on Milton and Addison.

In 1906, 1907, and 1908: Shakspere's *Julius Cæsar*; Milton's *Lycidas*, *Comus*, *L'Allegro* and *Il Penseroso*; Burke's Speech on Conciliation with America; Macaulay's Essay on Addison and Life of Johnson.

FRENCH

a. Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course the pupil should be able to pronounce French accurately, to read at sight easy French prose, to put into French simple English sentences taken from the language of everyday life, or based upon a portion of the French text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural of nouns, the inflection of adjectives, participles, and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix in the memory the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practice in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of easy modern prose in the form of stories, plays, or historical or biographical sketches; (2) constant practice, as in the previous year, in translating into French easy variations upon the texts read; (3) frequent abstracts, sometimes oral and sometimes written, of portions of the text already read; (4) writing French from dictation; (5) continued drill upon the rudiments of grammar, with constant application in the construction of sentences; (6) mastery of the forms and use of pronouns, pronominal adjectives, of all but the rare irregular verb forms, and of the simpler uses of the conditional and subjunctive.

Suitable texts for the second year are: About's *Le roi des montagnes*, Bruno's *Le tour de la France*, Daudet's easier short tales, La Bédollière's *La Mère Michel et son chat*, Erckmann-Chatrian's stories, Foa's *Contes biographiques* and *Le petit Robinson de Paris*, Foncin's *Le pays de France*, Labiche and Martin's *La poudre aux yeux* and *Le voyage de M. Perrichon*, Legouvé and Labiche's *La cigale chez les fourmis*, Malbot's *Sans famille*, Mairet's *La tâche du petit Pierre*, Mérimée's *Colomba*, extracts from Michelet, Sarcey's *Le siège de Paris*, Verne's stories.

b. Intermediate (counting one point)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight ordinary French prose or simple poetry, to translate into French a connected passage of English based on the text read, and to answer questions involving a more thorough knowledge of syntax than is expected in the elementary course.

THE WORK TO BE DONE.—This should comprise the reading of from 400 to 600 pages of French of ordinary difficulty, a portion to be in the dramatic form; constant practice in giving French paraphrases, abstracts or reproductions from memory of selected portions of the matter read; the study of a grammar of moderate completeness; writing from dictation.

Suitable texts are: About's stories, Augier and Sandeau's *Le gendre de M. Poirier*, Béranger's poems, Corneille's *Le Cid* and *Horace*, Coppée's poems, Daudet's *La Belle Nivernaise*, La Brète's *Mon oncle et mon curé*, Madame de Sévigné's letters, Hugo's *Hernani* and *La chute*, Labiche's plays, Loti's *Pêcheur d'Islande*, Mignet's historical writings, Molière's *L'avare* and *Le bourgeois gentilhomme*, Racine's *Athalie*, *Andromaque*, and *Esther*, George Sand's plays and stories, Sandeau's *Mademoiselle de la Seiglière*, Scribe's plays, Thierry's *Récits des temps mérovingiens*, Thiers's *L'expédition de Bonaparte en Egypte*, Vigny's *La canne de jonc*, Voltaire's historical writings

*c. Advanced **

THE AIM OF THE INSTRUCTION.—At the end of the advanced course the pupil should be able to read at sight, with the help of a vocabulary of special technical expressions, difficult French not earlier than that of the seventeenth century; to write in French a short essay on some simple subject connected with the works read; to put into French a passage of easy English prose; and to carry on a simple conversation in French.

THE WORK TO BE DONE.—This should comprise the reading of from 600 to 1000 pages of standard French, classical and modern, only difficult passages being explained in the class; the writing of numerous short themes in French; the study of syntax.

* Advanced French must be offered by candidates who wish to enter the course French 2 (see courses announced by the Department of Romance Languages and Literatures). It may not be counted among the points required for admission.

Suitable reading matter will be: Beaumarchais's *Barbier de Séville*; Corneille's dramas; the elder Dumas's prose writings; the younger Dumas's *La question d'argent*; Hugo's *Ruy Blas*, lyrics, and prose writings; La Fontaine's fables; Lamartine's *Graziella*; Marivaux's plays; Molière's plays; Musset's plays and poems; Pellissier's *Mouvement littéraire au XIX^e siècle*; Renan's *Souvenirs d'enfance et de jeunesse*; Rousseau's writings; Sainte-Beuve's essays; Taine's *Origines de la France contemporaine*; Voltaire's writings; selections from Zola, Maupassant, and Balzac.

GERMAN

a. Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course in German the pupil should be able to read at sight, and to translate, if called upon, by way of proving his ability to read, a passage of very easy dialogue or narrative prose, help being given upon unusual words and constructions; to put into German short English sentences taken from the language of everyday life or based upon the text given for translation; and to answer questions upon the rudiments of grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill upon pronunciation; (2) the memorizing and frequent repetition of easy colloquial sentences; (3) drill upon the rudiments of grammar—that is, upon the inflection of the articles, of such nouns as belong to the language of everyday life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word-order; (4) abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (5) the reading of from 75 to 100 pages of graduated texts from a reader, with constant practice in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English), and in the reproduction from memory of sentences previously read.

During the second year the work should comprise: (1) the reading of from 150 to 200 pages of literature in the form of easy stories and plays; (2) accompanying practice, as before, in the translation into German of easy variations upon the matter read, and also in the off-hand reproduction, sometimes orally and sometimes in writing, of the substance of short and easy selected passages; (3) continued drill upon the rudiments of the grammar, directed to the ends of enabling the pupil, first, to use his knowledge with facility in the formation of sentences, and, secondly, to state his knowledge correctly in the technical language of grammar.

Stories suitable for the elementary course can be selected from the following list: Andersen's *Märchen* and *Bilderbuch ohne Bilder*; Arnold's

Fritz auf Ferien; Baumbach's *Die Nonna* and *Der Schwiegersohn*; Gerstäcker's *Germelshausen*; Heyse's *L'Arrabbiata*, *Das Mädchen von Treppi*, and *Anfang und Ende*; Hillern's *Höher als die Kirche*; Jensen's *Die braune Erica*; Leander's *Träumereien*, and *Kleine Geschichten*; Seidel's *Märchen*; Stökl's *Unter dem Christbaum*; Storm's *Immensee* and *Geschichten aus der Tonne*; Zschokke's *Der zerbrochene Krug*.

Among the shorter plays the best available are perhaps Benedix's *Der Prozess*, *Der Weiberfeind*, and *Günstige Vorzeichen*; Elz's *Er ist nicht eifersüchtig*; Wichert's *An der Majorsecke*; Wilhelmi's *Einer muss heiraten*. It is recommended, however, that not more than one of these plays be read. The narrative style should predominate. A good selection of reading matter for the second year would be Andersen's *Märchen*, or *Bilderbuch*, or Leander's *Träumereien*, to the extent of, say, forty pages. After that such a story as *Das kalte Herz*, or *Der zerbrochene Krug*; then *Höher als die Kirche*, or *Immensee*; next a good story by Heyse, Baumbach, or Seidel; lastly *Der Prozess*.

b. Intermediate (counting one point)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight German prose of ordinary difficulty, whether recent or classical; to put into German a connected passage of simple English, paraphrased from a given text in German; to answer any grammatical questions relating to usual forms and essential principles of the language, including syntax and word-formation; and to translate and explain (so far as explanation may be necessary) a passage of classical literature taken from some text previously studied.

THE WORK TO BE DONE.—The work should comprise, in addition to the elementary course, the reading of about 400 pages of moderately difficult prose and poetry, with constant practice in giving, sometimes orally and sometimes in writing, paraphrases, abstracts, or reproductions from memory of selected portions of the matter read; also grammatical drill upon the less usual strong verbs, the use of articles, cases, auxiliaries of all kinds, tenses and modes (with special reference to the infinitive and subjunctive), and likewise upon word-order and word-formation.

The intermediate course is supposed to be the elementary course, plus one year's work at the rate of not less than four recitations a week. Suitable reading matter for the third year can be selected from such works as the following: Ebner-Eschenbach's *Die Freiherren von Gemperlein*; Freytag's *Die Journalisten* and *Bilder aus der deutschen Vergangenheit*—for example, *Karl der Grosse*, *Aus den Kreuzzügen*, *Doktor Luther*, *Aus dem Staat Friedrichs des Grossen*; Fouqué's *Undine*; Gerstäcker's *Irrefahrten*; Goethe's *Hermann und Dorothea* and *Iphigenie*; Heine's poems and *Reisebilder*; Hoffmann's *Historische Erzählungen*; Lessing's *Minna von Barnhelm*; Meyer's *Gustav Adolfs Page*; Moser's *Der Bibliothekar*; Riehl's *Novellen*—for example, *Burg*

Neideck, Der Fluch der Schönheit, Der stumme Ratsherr, Das Spielmannskind ; Rosegger's Waldheimat ; Schiller's Der Neffe als Onkel, Der Geisterseher, Wilhelm Tell, Die Jungfrau von Orleans, Das Lied von der Glocke, Balladen ; Scheffel's Der Trompeter von Säkkingen ; Uhland's poems ; Wildenbruch's Das edle Blut.

c. Advanced *

THE AIM OF THE INSTRUCTION.—At the end of the advanced course the student should be able to read, after brief inspection, any German literature of the last one hundred and fifty years that is free from unusual textual difficulties, to put into German a passage of simple English prose, to answer in German questions relating to the lives and works of great writers studied, and to write in German a short, independent theme upon some assigned topic.

THE WORK TO BE DONE.—The work of the advanced course (last year) should comprise the reading of about 500 pages of good literature in prose and poetry, reference readings upon the lives and works of the great writers studied, the writing in German of numerous short themes upon assigned subjects, and independent translation of English into German.

GREEK

Elementary (counting three points)

a. i. Greek Grammar.

The common forms, idioms, and constructions, and the general grammatical principles of Attic Greek prose.

ii. Greek Composition.

Translation into Greek of detached sentences to test the candidate's knowledge of grammatical constructions.

The examination in the two subjects immediately preceding will be based on the first two books of Xenophon's *Anabasis*.

b. Xenophon.

The first four books of the *Anabasis*.

c. Homer.

The first three books of the *Iliad* (omitting II, 494-end), including constructions, poetical forms, and prosody.

f. Advanced Greek Composition.

Translation into Greek of continuous prose based on Xenophon and other Attic prose of similar difficulty.

g. Sight Translation.

Translation into English at sight, based on prose of no greater difficulty than Xenophon's *Anabasis*.

* Advanced German may be offered by candidates desiring to take advanced courses in German. It may not be counted among the points required for admission.

Advanced (counting one point)

Candidates offering Greek as an advanced subject must present the equivalent of the course known as Greek **B** (see courses announced by the Department of Greek). In Homer, for which no equivalent will ordinarily be accepted, the minimum requirement will be 1600 lines in addition to the amount offered for the elementary examination. The candidate must also offer the eight orations of Lysias in Morgan's edition, or an equivalent amount of similar Greek, and in prose composition at least twenty exercises in the writing of connected narrative prose. The exercises in Part III of Allinson's Greek Prose Composition will show the grade of preparation demanded. Candidates applying for examination in this subject must designate the equivalents, if any, which they wish to offer.

HISTORY

Elementary (counting one point)

Candidates offering history as an elementary subject may present themselves for examination upon either of the following groups. They will not be permitted to offer both of these groups as elementary subjects.

First Group: *

- a.* Ancient history, including a brief introductory study of the Oriental peoples, and early mediæval history to the death of Charlemagne, with due reference to art, literature, and government.
- b.* Mediæval and modern history, with due reference to the growth of the state-system.

Second Group:

- c.* English history, with due reference to social and political development.
- d.* American history, with the elements of civil government.

NOTE.—For preparation in either of these groups a course of study equivalent to at least three lessons a week for two years will be needful. On examination a candidate must show such general knowledge of each field offered as may be acquired from the study of an accurate text-book of not less than three hundred pages. Since, however, the examination will be so framed as to require comparison and the use of judgment rather than mere exercise of memory on the part of the pupil, it is recommended that the teacher prescribe a course of supplementary reading of not less than five hundred pages dealing with the more important periods and events in both of the historical fields offered. Geographical knowledge will be tested by requiring the location of places and movements on an outline map.

Advanced (counting one point)

The requirement in Advanced History is intended to be an equivalent for History **A**—the course prescribed in Columbia College

* Examinations in Greek history and Roman history will be given in 1903 (but not thereafter), for the benefit of candidates who in 1902 took a preliminary examination in one of these subjects.

(see courses given by Department of History). The work done at school, therefore, should be substantially identical with that course. Those candidates who have taken the examination in Elementary History, and desire to offer History as an advanced subject, must present themselves for examination upon the historical fields included in *that group which they did not offer as an elementary subject*. For example, if a candidate offers the first group as the elementary subject, he must offer the second group as the advanced subject, and *vice versa*. The examination will pre-suppose superior ability on the part of the candidate in Advanced History to understand the significance of historical events, movements, or tendencies, to discern similarities and contrasts, and to combine results.

As further evidence of proficiency, satisfactory written work, done at school and duly certified by the teacher as to independent preparation, must be submitted. This work must be presented in the form of a note-book, or bound collection of notes, containing not less than five thousand words on each historical field offered, and must show practice in at least three of the following exercises:

- (a) Notes and digests of reading outside of the text-books.
- (b) Written recitations requiring the use of judgment, and the application to new questions of knowledge already gained.
- (c) Written parallels between historical characters, events, or periods.
- (d) Brief studies of topics limited in scope, prepared outside the class-room and illustrated by some reference to contemporary material.
- (e) Historical maps or charts showing explorations, migrations, conquests, territorial changes, or social phenomena.

The written work must be sent to the Secretary of Columbia University, two weeks before the entrance examination begins.

LATIN

Elementary (counting four points *)

a. i. Latin Grammar.

The inflections; the simpler rules for composition and derivation of words; syntax of cases and verbs; structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse and the subjunctive.

ii. Latin Composition.

Translation into Latin of detached sentences and very easy continuous prose based upon Cæsar and Cicero.

* Candidates for admission to Columbia College, the College of Physicians and Surgeons, Teachers College, or the Schools of Applied Science and Architecture who are unable to offer the whole of Elementary Latin will be permitted to offer two points from this subject. Such candidates should offer parts *a* and *c*, or *a* and *d*, except candidates for the College of Physicians and Surgeons who should offer *a* and either *b* or *c* or *d*, as indicated above.

b. Cæsar.*

Any four books of the Gallic War, preferably the first four.

c. Cicero.

Any six orations from the following list, but preferably the first six mentioned:

The four orations against Catiline, Archias, and the Manilian Law, Marcellus, Roscius, Milo, Sestius, Ligarius, the Fourteenth Philippic.

d. Vergil.

The first six books of the *Aeneid*, including prosody.

l. Advanced Latin Composition.

Translation into Latin of continuous prose of moderate difficulty based on Cicero.

m. Sight Translation.

Translation into English at sight, based exclusively on prose of no greater difficulty than the easier parts of Cicero's orations.

Advanced (counting one point)

Candidates offering Latin as an advanced subject must present the equivalent of the course known as Latin A (see courses announced by the Department of Latin). This course comprises the reading of Cicero's *De Senectute* and *De Amicitia*, a review of the syntax of the verb as contained in any standard grammar, and a knowledge of prose composition as represented by the second part of Daniells's *New Latin Composition*; also the reading of the first and third books of the *Odes* of Horace, with a satisfactory knowledge of the prosody. Candidates applying for examination in this subject must designate the equivalents, if any, which they wish to offer.

MATHEMATICS

Elementary (counting three points)

a. i. Algebra to quadratics.

Factors, common divisors, and multiples, fractions, equations of the first degree with one or more unknown quantities, evolution, the doctrine of exponents, radicals, radical equations reducible to equations of the first degree, and putting problems into equations.

ii. Algebra from quadratics.

Quadratic equations, equations with one or more unknown quantities that can be solved by the methods of quadratic equations, problems depending upon such equations, ratio and proportion, and the binomial theorem for positive entire exponents.

c. Plane geometry.

Plane geometry, including the solution of simple original exercises and numerical problems.

* Cæsar can be offered only by candidates for admission to the College of Physicians and Surgeons.

Advanced (counting one point)

d. Solid geometry.

Solid and spherical geometry, including the solution of simple original exercises and numerical problems.

a. iii. Algebra.

The arithmetical and geometrical progressions, the elementary treatment of permutations and combinations, and the use of four-place and five-place tables of logarithms.

e. Plane trigonometry.

The definitions and relations of the six trigonometrical functions as ratios, proof of important formulæ, theory of logarithms and use of tables, solution of right and oblique plane triangles.

PHYSICS

Elementary (counting one point)

The candidate's preparation in physics should include:

- a.** The study of a standard text-book supplemented by the use of many varied numerical problems, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws in elementary physics.
- b.** Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c.** Individual laboratory work, comprising at least forty exercises distributed about as follows: mechanics 17, sound 3, heat 5, light 6, electricity 9.

A list of suitable experiments in physics is contained in the definitions of the requirements published by the College Entrance Examination Board and may be obtained upon application to the Secretary of the Board, Post-Office Sub-Station 84, New York, N. Y.

LABORATORY NOTE-BOOK.—Every candidate must present *at the time of his examination in physics* a note-book in which he has recorded the steps and the results of his laboratory experiments. A candidate who fails to present such a note-book cannot receive credit for the examination. Each note-book must contain an index of the experiments which it describes and must be endorsed by the instructor, the endorsement being written in ink on the inside of the cover. The endorsement must in effect be as follows:

I certify that this note-book is a true and original record of experiments actually performed by..... in the physical laboratory of..... School during the year 19.....

Instructor in Physics.

Advanced (counting one point)

Candidates offering physics as an advanced subject must have studied physics for a full year after satisfactorily completing the elementary requirement. The work during this time must be devoted to a more thorough and extensive study of the subjects previously covered in a general way. Besides class-work, it must include at least sixty experiments actually performed in the laboratory by the candidate. A laboratory note-book must be submitted at the time of the examination. It must contain a certificate from the teacher that it is a true record of the candidate's work. It will be returned to the candidate upon subsequent application to the Secretary of the University.

PHYSIOGRAPHY (counting one point)

The candidate's preparation in physiography should include the study of one of the modern text-books by Davis, Tarr, Dryer, or Gilbert and Brigham, together with an approved laboratory and field course of at least forty exercises actually performed by the candidate.*

The candidate will be required to present at the time of his examination the original note-book in which he recorded, with dates, the steps and results of his laboratory exercises. This book, which should contain an index of subjects, must bear the endorsement of the teacher, certifying that it is a true record of the candidate's work.

SPANISH (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the course the pupil should be able to pronounce Spanish accurately, to read at sight easy Spanish prose, to put into Spanish simple English sentences taken from the language of everyday life, or based upon a portion of the Spanish text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the conjugation of the regular and the more common irregular verbs, the inflection of nouns, adjectives, and pronouns, and the elementary rules of syntax; (3) exercises containing illustrations of the principles of grammar; (4) the reading and accurate rendering into good English of from 100 to 175 duodecimo pages of graduated texts, with translation into Spanish of easy variations of the sentences read; (5) writing Spanish from dictation.

* For a more detailed statement of the requirement in physiography the reader is referred to the definitions of the requirements published by the College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of modern prose from different authors; (2) practice in translating Spanish into English, and English variations of the text into Spanish; (3) continued study of the elements of grammar and syntax; (4) mastery of all but the rare irregular verb forms and of the simpler uses of the moods and tenses; (5) writing Spanish from dictation.

Suitable texts for the second year are: Valera's *El pájaro verde*; Alarcón's *El final de Norma*, *El capitán Veneno*; Valdès's *José*; Galdós's *Doña Perfecta*; *Marianela*; Padre Isla's version of *Gil Blas*; Carrion and Aza's *Zaragüeta*.

ZOOLOGY (counting one point)

In general, zoölogy is not recommended as an entrance subject unless the study has been preceded or accompanied by that of physics and chemistry, which form the most desirable groundwork for collegiate courses in biology. The entrance examination in zoölogy is designed to test, first, the candidate's practical acquaintance with the natural history, structure, and relationships of some of the leading types of animals, and, second, his knowledge of the more essential facts of physiology.

Practical Zoölogy. A practical examination on at least ten common animal types, and the presentation by the candidate of a laboratory note-book, certified by the teacher, as evidence of a laboratory course actually performed. Examples of the types suggested are the frog, fish, mollusk, insects, crustaceans, annelid, starfish, hydroid (*Hydra*), and protozoan. In the examination less weight is laid on a knowledge of anatomical *minutiae* than on the ability to recognize the specimen and its allies, to indicate its relationships, and to point out the leading features of its life-history, organization, and physiology.

Elementary Physiology. The nature of foods and their history in the body; the essential facts of digestion, absorption, circulation, secretion, excretion, and respiration; the motor, nervous, and sensory functions; and the structure of the various organs by which these operations are performed. Martin's *Human Body* (briefer course) forms a suitable basis for this work; but teachers are recommended as far as possible to correlate the physiology of man and the higher animals with that of the lower forms studied in the course on practical zoölogy.

CIRCULARS OF INFORMATION

For information as to admission to advanced standing, regulations regarding special students, tuition fees, scholarships, curriculum, and scheme of attendance, application should be made to the Secretary of the University for such circulars of information as are necessary. The following are distributed without charge:

- Announcement of Columbia College
- Announcement of Barnard College
- Announcement of Teachers College
- Announcement of the College of Physicians and Surgeons
- Circular of General Information, Schools of Applied Science
- Announcement of the Courses in Fine Arts (including Architecture)

In connection with the general circular of the Schools of Applied Science, the candidate should ask for the special circular of the particular Course in which he is interested. These circulars show the courses in Mining Engineering, Metallurgy, Chemistry, Civil and Sanitary Engineering, Electrical Engineering, and Mechanical Engineering.

For information upon any point not covered by the pamphlets, inquire of the Secretary of Columbia University.

Additional copies of this pamphlet may be obtained upon application. Instructors are requested to furnish the Secretary of the University, at as early a day as possible, with the names and addresses of students to whom the pamphlet should be sent.

For a statement of the conditions under which credits from other institutions are accepted in lieu of entrance examinations, see the announcement of the school or college concerned.

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ENTRANCE EXAMINATIONS

AND

ADMISSION

1908

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These include:

1. The Report of the President and the Treasurer to the Trustees.
2. The Catalogue of the University, issued in December, price 25 cents.
3. The Announcements of the several Colleges, Schools, and Divisions, issued in the Spring, and relating to the work of the next year. These are made as accurate as possible, but the right is reserved to make changes in detail as circumstances require. The current number of any of these Announcements will be sent without charge upon application to the Secretary of the University.

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ADMISSION TO COLUMBIA UNIVERSITY

A student may enter Columbia University as either (1) a matriculated student, accepted by the University as having fulfilled the preliminary qualifications for candidacy for a degree, a certificate in architecture, music, or design, or a diploma in teaching; or (2) a non-matriculated student, permitted to attend such courses as he may be qualified to take, but not regarded as a candidate for a degree, a certificate in architecture, music, or design, or a diploma in teaching.

The requirements for admission by examination to Columbia College, Barnard College, the College of Physicians and Surgeons, the College of Pharmacy (University Course), the Schools of Mines, Engineering and Chemistry, and the Schools of Fine Arts (courses leading to certificates), are stated on pages 45-21.

There are no examinations for admission to the Schools of Law, Political Science, Philosophy, Pure Science, and Fine Arts (courses leading to degrees), or to Teachers College. In general the requirements for admission to these departments are as follows:

Schools of Law, Political Science, Philosophy, and Pure Science, and Teachers College (Graduate curricula)—the completion of the full course in some recognized college or scientific school, or its equivalent;

Teachers College (Professional curriculum)—the completion of two years of study in some recognized college or scientific school;

School of Architecture (course leading to degree of Bachelor of Architecture)—the completion of two years of study in some recognized college or scientific school, and a practical knowledge of the orders of architecture, of elementary projections and shades and shadows, of the elements of architectural rendering, and of freehand drawing;

School of Music (course leading to degree of Bachelor of Music)—the completion of two years of study in some recognized college, and the ability to play, on the pianoforte, the Two-Part Inventions of Bach.

For a more detailed statement of the requirements for admission to these departments, see the separate announcements of the Schools and Faculties concerned.

ADMISSION OF MATRICULATED STUDENTS

Candidates are enrolled as matriculated students upon presenting evidence of having fulfilled the stated requirements of admission to candidacy for a degree, a certificate of proficiency, or a diploma in teaching in Columbia University. Such evidence may consist in:

1. (a) A certificate of graduation from an acceptable college or scientific or professional school, or a foreign institution of equivalent grade, or

(b) Certification of the satisfactory completion of certain specified courses at some such institution, accompanied by evidence of honorable dismissal therefrom. Such certificate may, under appropriate conditions, be that of the Summer Session or of the Department of Extension Teaching of Columbia University, or other institutions maintaining courses of equivalent grade.

The entrance credits of candidates who have completed at least one full year of collegiate or technical work, whether based upon examination or certification, are accepted by Columbia University in so far as they correspond with its requirements.

2. Certificates from the College Entrance Examination Board and the Committee on Entrance Examinations of Columbia University, or the College Entrance Diploma of the Education Department of the State of New York, and certificates of entrance examinations taken in good faith for admission to other institutions. Except for reasons of weight such certificates are not accepted as covering subjects passed more than twenty-nine months previous to the date of presentation. No certificates from preparatory schools nor from preparatory departments of colleges will be accepted in lieu of entrance examinations. For detailed information as to admission by examination see pages 10 *et seq.*

For the College Entrance Diploma see pages 8-9.

3. Certification of the appropriate faculty of Columbia University, or the duly authorized representative of such faculty, that a candidate, although unable to present the formal credits as prescribed under 1 and 2, has given evidence of an intellectual training and equipment equal to that evidenced by the completion of the formal entrance requirements. Such certification is made only for reasons of great weight and ordinarily only in the case of students who have completed satisfactorily at least a year of residence in the University as non-matriculated students.

ADMISSION AS NON-MATRICULATED STUDENTS

Non-matriculated students are admitted under conditions specified in the announcements of the several departments. They may not be regarded as candidates for a degree, certificate, or diploma in teaching, but they may receive a formal statement as to the satisfactory completion of any course or courses.

REGISTRATION

Before attending any University exercises each student must register, i. e., must present himself in person to furnish the information necessary for the University records and to file statements of the courses he is authorized to pursue. Details will be found in the Bulletin of the faculty under which the student purposes to register.

Candidates for the Higher Degrees may register at any time during the academic year. Candidates for the degree of Bachelor of Arts or Bachelor of Science either at the beginning of the first or the second

half-year. Candidates for the professional degrees, certificates, or diplomas in teaching are, in general, permitted to register only at the beginning of the academic year.

The attention of students is called to the fact that it is now possible to register either as a matriculated or a non-matriculated student under any faculty of the University during the Summer Session as well as during the academic year. For 1908-09 the registration dates are July 3 and 6.

INQUIRIES

Inquiries for more detailed information than is contained herein may be made in person, or by mail or telephone, of the Secretary of the University, Room 213 Library Building, Columbia University, New York, N. Y. (telephone 1400 Morningside).

The Secretary will furnish upon request printed forms of application for entrance examinations, sample question papers, or blanks for admission to advanced standing, or as a non-matriculated student. He will obtain from the appropriate officers authoritative replies to specific inquiries as to the conditions governing the acceptance of any given certificate. A personal conference between a candidate and the appropriate faculty representative may be also arranged for through him.

TIME OF PRESENTING CERTIFICATES

The examination records of candidates taking the entrance examinations of Columbia University and of those taking the examinations of the College Entrance Examination Board, who have announced on the application blank their intention of entering Columbia University, are recorded automatically in the office of the Registrar of the University, and referred by him to the appropriate admission committee. All other certificates must be placed by the candidate in the hands of the admissions committee under which he plans to register, in ample time for consideration by the committee, and report to the candidate before registration. If sent by mail they should be addressed to the Secretary of the University, and accompanied by a letter stating (a) the specific college or school of the University the candidate desires to enter, and (b) the address to which the reply should be sent. Applications for admission as non-matriculated students should be similarly treated.

In the case of candidates for admission to advanced standing, or for admission as non-matriculated students, time should be allowed to make arrangements for the candidate to present himself, if necessary, for such formal examination as may be prescribed by the Committee on Admissions. Such examinations begin ordinarily at least ten days before the opening of the half-year.

ADMISSION WITH CONDITIONS

Candidates who have not entirely completed the stated requirement for admission, but who in the judgment of the Committee on Admissions are regarded as qualified to pursue to advantage the work for

which they desire to register, may be admitted conditionally. No general information as to the terms under which students are admitted conditionally can be given as each case is considered individually upon its merits. The attention of candidates is called to the special regulations as to admission with conditions stated in the Announcements of Barnard College, the College of Physicians and Surgeons, and the Schools of Mines, Engineering and Chemistry.

COLLEGE ENTRANCE DIPLOMA

The attention of all students who intend to offer the Regents' College Entrance Diploma for admission to Columbia College, Barnard College, the College of Pharmacy (University Course), the Schools of Mines, Engineering and Chemistry, or the Schools of Fine Arts (courses leading to certificates) is called to the following general statement:

Neither of the three count electives, Advanced Algebra and History, is accepted.

To secure credit for Drawing, both Drawing, three counts, and Advanced Drawing, three counts, must be offered; and in addition a set of at least twenty drawings duly certified by the teacher must be presented with the diploma.

In Physics, Chemistry, Physiography, Advanced Botany, and Advanced Zoölogy, a note-book duly certified by the teacher must be presented with the diploma.

In the case of the several schools the following points should be noted:

Columbia College

The diploma of the "Arts Department" will admit a candidate to either the A.B. or the B.S. course, if the following instructions are observed:

Latin must include (advanced) Prose Composition and Prose Translation at Sight. Caesar is not accepted as satisfying any part of the requirement.

If the second foreign language is Greek, five elective counts must be devoted to the third year in that subject and the work must include, besides Xenophon and Homer, (advanced) Prose Composition and Prose Translation at Sight.

The diploma of the "Science Department" will admit a candidate, who does not obtain twenty counts in Latin, to the B.S. course if the following instructions are observed:

The diploma must cover Chemistry and either (1) three years each of both French and German, or (2) three years of either French or German, and Solid Geometry and Trigonometry. In the latter case Latin (2 years) may be offered as the second foreign language, but, if offered, must include either Cicero or Vergil.

Barnard College

The diploma of the "Arts Department" will admit a candidate to the A.B. course if the following instructions are observed:

Latin must include (advanced) Prose Composition and Prose Translation at Sight. Cæsar is not accepted as satisfying any part of the requirement.

If the second foreign language is Greek, five elective counts must be devoted to the third year in that subject, and the work must include, besides Xenophon and Homer, (advanced) Prose Composition, and Prose Translation at Sight.

The diploma of the "Science Department" will admit a candidate to the B.S. course if the following instructions are observed:

The diploma must cover a second science—preferably Chemistry—and either (1) three years each of both French and German, or (2) three years of either French or German, and Solid Geometry and Trigonometry. In the latter case Latin (2 years) may be offered as the second foreign language, but, if offered, must include either Cicero or Vergil.

The diploma of either the "Arts Department" or of the "Science Department" will admit a candidate to the general two-years course, if the following instructions are observed:

Drawing must not be included among the electives and Cæsar cannot be offered as satisfying any part of the Latin requirement.

Schools of Mines, Engineering and Chemistry

The diploma of the "Science Department" will admit a candidate to the Schools of Mines, Engineering and Chemistry, if the following instructions are observed:

The first foreign language must be German (or French). The second foreign language must be French (or German), Spanish, or Latin. If Latin is offered it must include Caesar or Cicero or Vergil.

The three electives must be (1) Chemistry, (2) Solid Geometry and Trigonometry, (3) Drawing and Advanced Drawing.

Schools of Fine Arts

The diploma of either the "Arts Department" or the "Science Department" will admit a candidate to the courses leading to certificates, if the following instructions are observed:

In the School of Architecture—Drawing must be included among the electives. Greek is not accepted. The candidate must satisfy the supplementary requirement as stated on page 20.

In the School of Music—Cæsar is not accepted as satisfying any part of the Latin requirement. The candidate must satisfy the supplementary requirement as stated on page 21.

In the School of Design—The diploma must cover Drawing and either French (2 years) or German (2 years). Cæsar is not accepted as satisfying any part of the Latin requirement,

ENTRANCE EXAMINATIONS

Committee

Professor CLARENCE H. YOUNG, *Chairman*
Professor FRANK N. COLE
Professor HENRY E. CRAMPTON
Professor ALFRED D. F. HAMLIN
Professor WILLIAM A. HERVEY
Professor SAMUEL W. LAMBERT
Professor NELSON G. McCREA
Professor RALPH E. MAYER
Professor HENRY H. RUSBY
Professor JULIUS SACHS

GENERAL STATEMENT

Examinations for admission to Columbia College, Barnard College, the College of Physicians and Surgeons, the College of Pharmacy (University Course), the Schools of Mines, Engineering and Chemistry, and the Schools of Fine Arts (courses leading to certificates) are held each year in January, June, and September. In 1908 they will be held June 15-20 and September 14-21, and in 1909 January 18-25.

In June the examinations are those of the College Entrance Examination Board, of which Columbia University is a member. The University accepts the numerical ratings of the Board, but fixes a uniform passing mark for the several colleges and schools.

In January and September the examinations will be held only at the University. The Board *at present* holds examinations only in June.

While all persons taking the January examinations will receive due credit for the results of the examinations, students may be admitted, at the beginning of the second half-year, only to Columbia College and Barnard College.

All correspondence with the College Entrance Examination Board, all requests for its publications, etc., should be addressed to its Secretary, Post-Office Sub-Station 84, New York, N. Y.

All correspondence with the University should be addressed to the Secretary of the University.

APPLICATION FOR EXAMINATION

Every candidate for examination is required to file an application. For the examinations in June, 1908, the application must be filed with the Secretary of the College Entrance Examination Board.

Applications for examination in the United States east of the Mississippi River (also at Minneapolis, St. Louis, and other points on the Mississippi River) must be filed on or before June 1. Applications for examination elsewhere in the United States or in Canada must be filed on or before May 25. Applications for examination outside of the United States and Canada must be filed on or before May 11. Requests for blank forms of application should be addressed to the Secretary of the Board.

For the examinations in September, 1908, and January, 1909, applications must be filed with the Registrar of Columbia University on or before September 7 and January 11. Requests for blank forms of application should be addressed to the Secretary of Columbia University and the Registrar of Barnard College.

EXAMINATION FEE

Every application for examination in June must be accompanied by a fee of \$5 for all candidates examined at points in the United States and Canada, and \$15 for all candidates examined at points outside of the United States and Canada.

Every application for examination in January or September must be accompanied either by a fee of \$5, by a receipt from the Bursar for an examination fee previously paid, or by the receipt issued by the Secretary of the College Entrance Examination Board for the June examinations immediately preceding. *The latter will be accepted in either September or January, but not in both; and a single fee paid to the University will cover only two consecutive series of examinations, namely, January and September or September and January.*

If a late application is accepted either by the College Entrance Examination Board, or by the University, a second fee of \$5 must be paid.

The examination fee receipt should be carefully preserved. It must be presented by the candidate to the Supervisor in charge of the examinations which he attends as evidence that he is entitled to be admitted to the same. No candidate will be admitted to the January or September examinations upon the receipt of the Board, unless that receipt bears the certification of the Registrar of Columbia University that the candidate's application has been filed.

DIVISION OF EXAMINATION

A candidate may present himself at any of the scheduled series of examinations subject to the following restrictions:

- (1) He may not present himself at more than four series of examinations except by special consent of the Committee on Admissions of the School which he purposed to enter.
- (2) At the first and the second series credit will be given only for such subjects, or lettered (or numbered) parts of a subject as are approved by his principal instructor.
- (3) The results of an examination shall stand to his credit for twenty-nine months, but no longer.

PLACES OF EXAMINATION

In June, 1908, entrance examinations will be held at a large number of widely distributed points, a list of which will be published by the College Entrance Examination Board about March 1. Requests for examinations at particular points should reach the Secretary of the Board not later than February 1.

In September, 1908, and January, 1909, examinations will be held only at the University.

EXAMINATION SUBJECTS

Columbia University recognizes the following examination subjects, which may be offered for admission to one or more of the colleges and schools included in the University, each subject counting for a specific number of points as indicated below:

English.....	3	Musical Appreciation	1
Elementary French.....	2	Musical Performance ¹	2
" German.....	2	Physiography.....	1
" Greek.....	3	Shopwork ¹	1
" History.....	2	Zoölogy.	1
" Italian ¹	2	Intermediate French.....	1
" Latin.....	4	" German.....	1
" Mathematics.....	3	Advanced English ¹	1
" Physics.....	1	" Greek ¹	1
" Spanish.....	2	" History ¹	1
Botany.....	1	" Latin ¹	1
Chemistry.....	1	" Mathematics.....	1
Drawing.....	1	" Physics ¹	1
Harmony.....	1		

For a statement as to the combinations of subjects which may be offered by candidates for admission to the several colleges and schools see pages 15-21.

SCHEDULE OF EXAMINATIONS

The examinations at Columbia University will be held as follows:

For men, in Hamilton Hall in January, and in the Gymnasium in June and September;

For women, in Barnard College in January, June, and September.

Candidates taking these examinations must report to the Supervisor, in the examination room, fifteen minutes in advance of the first examination which they are to attend.

Candidates will be examined in this subject only in January and September.

Schedule of Examinations

June 15-20, 1908

Monday, June 15

Mathematics <i>a, i, ii</i> (Elementary Algebra: to Quadratics; Quadratics, etc.).....	9.30-12.30
History <i>b</i> (Mediæval and Modern History).....	1.30-3.30
History <i>d</i> (American History).....	1.30-3.30
Physics (Elementary).....	3.45-5.45
Botany.....	3.45-5.45
Zoölogy.....	3.45-5.45

Tuesday, June 16

Mathematics <i>c, d</i> (Plane Geometry; Solid Geometry).....	9-12
History <i>a</i> (Ancient History).....	1.30-3.30
History <i>c</i> (English History).....	1.30-3.30
German <i>a</i> (Elementary German).....	3.45-5.45

Wednesday, June 17

Latin <i>b</i> (Cæsar).....	9-10.30
Latin <i>m</i> (Sight Translation).....	10.45-12.30
French <i>a</i> (Elementary French).....	1.30-3.30
German <i>b</i> (Intermediate German).....	3.45-5.45
Spanish.....	3.45-5.45

Thursday, June 18

Latin <i>c</i> (Cicero).....	9-11
Latin <i>a</i> (Grammar and Composition).....	11.15-12.30
Latin <i>d</i> (Vergil's <i>Aeneid</i> , Books I-VI).....	1.30-3.30
French <i>b</i> (Intermediate French).....	3.45-5.45

Friday, June 19

English <i>a</i> (Reading and Practice).....	9-11
Latin <i>l</i> (Prose Composition).....	11.15-12.30
English <i>b</i> (Study and Practice).....	1.30-3.30
Chemistry.....	3.45-5.45
Physiography.....	3.45-5.45
Greek <i>c</i> (Homer's <i>Iliad</i> , Books I-III).....	3.45-5.45
Music <i>b</i> (Harmony).....	3.45-5.45

Saturday, June 20

Greek <i>b</i> (Xenophon).....	9-11
Drawing.....	9-11
Greek <i>a</i> (Grammar and Composition).....	11.15-12.30
Mathematics <i>e</i> (Trigonometry).....	1.30-3.30
Greek <i>g</i> (Sight Translation).....	1.30-3.30
Greek <i>f</i> (Prose Composition).....	3.45-5.15
Music <i>a</i> (Musical Appreciation).....	3.45-5.45

Schedule of Examinations

September 14-21, 1908, January 18-25, 1909

Monday, September 14 and January 18

Mathematics *a, i, ii* (Elementary Algebra: to Quadratics;

Quadratics, etc.).....	9.30-12.30
History <i>b</i> (Mediæval and Modern History).....	1.30-3.30
History <i>d</i> (American History).....	1.30-3.30
Physics (Elementary).....	3.45-5.45
Botany.....	3.45-5.45
Zoölogy.....	3.45-5.45

Tuesday, September 15 and January 19

Mathematics <i>c, d</i> (Plane Geometry; Solid Geometry).....	9-12
History <i>a</i> (Ancient History).....	1.30-3.30
History <i>c</i> (English History).....	1.30-3.30
German <i>a</i> (Elementary German).....	3.45-5.45

Wednesday, September 16 and January 20

Shopwork (Written).....	9-10.30
Latin <i>b</i> (Cæsar).....	9-10.30
Latin <i>m</i> (Sight Translation).....	10.45-12.30
French <i>a</i> (Elementary French).....	1.30-3.30
German <i>b</i> (Intermediate German).....	3.45-5.45
Spanish.....	3.45-5.45
Italian	3.45-5.45

Thursday, September 17 and January 21

Latin <i>c</i> (Cicero).....	9-11
Latin <i>a</i> (Grammar and Composition).....	11.15-12.30
Latin <i>d</i> (Vergil's <i>Aeneid</i> , Books I-VI).....	1.30-3.30
French <i>b</i> (Intermediate French).....	3.45-5.45

Friday, September 18 and January 22

English <i>a</i> (Reading and Practice).....	9-11
Latin <i>l</i> (Prose Composition).....	11.15-12.30
English <i>b</i> (Study and Practice).....	1.30-3.30
Chemistry.....	3.45-5.45
Physiography.....	3.45-5.45
Greek <i>c</i> (Homer's <i>Iliad</i> , Books I-III).....	3.45-5.45
Music <i>b</i> (Harmony).....	3.45-5.45

Saturday, September 19 and January 23

Greek <i>b</i> (Xenophon).....	9-11
Drawing.....	9-11.30
Greek <i>a</i> (Grammar and Composition).....	11.15-12.30
Advanced History.....	1.30-3.30
Mathematics <i>e</i> (Trigonometry).....	1.30-3.30
Greek <i>g</i> (Sight Translation).....	1.30-3.30
Greek <i>f</i> (Prose Composition).....	3.45-5.45
Music <i>a</i> (Musical Appreciation)	3.45-5.45

Monday, September 21 and January 25

Advanced English.....	9-12
Advanced Greek.....	9-12
Shopwork (Laboratory).....	10-12
Advanced Latin.....	1-4
Advanced Physics.....	1-4

TO ENTER COLUMBIA COLLEGE

Total requirement.....15 points

The candidate *must* offer

English (page 25).....counting 3 points

Elementary Mathematics (page 35).... " 3 "

and in the case of candidates for A.B. degree:

Elementary Latin (see note, page 34).. " 4 "

or in the case of candidates for B.S. degree:

either Elementary Latin (see note, page 34).. " 4 "

or Chemistry (page 24)..... " 1 point

Elementary Physics (page 38)..... " 1 "

Intermediate or Advanced subjects..... " 2 points

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject

Elementary Greek (page 31).....counting 3 points

Elementary History (see note, page 32) " 2 "

or " 1 point

Drawing (page 24)..... " 1 "

Music (page 36)..... " 1 "

Intermediate French (page 29)..... " 1 "

Intermediate German (page 30)..... " 1 "

Advanced English (page 27)..... " 1 "

Advanced Greek (page 31)..... " 1 "

Advanced History (page 32)..... " 1 "

Advanced Latin (page 34)..... " 1 "

Advanced Mathematics (page 36)..... " 1 "

Advanced Physics (page 38)..... " 1 "

and in the case of candidates for B.S. degree:

Elementary Latin (see note, page 34).. " 4 points

or " 2 "

The candidate may offer not more than 4 points in all from the four subjects following:

Elementary French (page 28).....counting 2 points

Elementary German (page 29)..... " 2 "

Italian (page 33)..... " 2 "

Spanish (page 40)..... " 2 "

The candidate may offer not more than 3 points in all from the six subjects following:

Botany (page 23).....counting 1 point

Chemistry (page 24)..... " 1 "

Elementary Physics (page 38)..... " 1 "

Physiography (page 38)..... " 1 "

Shopwork (page 39)..... " 1 "

Zoölogy (page 40)..... " 1 "

TO ENTER BARNARD COLLEGE

Total requirement.....15 points

The candidate *must* offer

English (page 25).....counting 3 points

Elementary Mathematics (page 35).... " 3 "

and in the case of candidates for A.B. degree:

Elementary Latin (see note, page 34).. " 4 "

or in the case of candidates for B.S. degree:

Science..... " 2 "

Intermediate or Advanced subjects.... " 2 "

or in the case of candidates for the general two-years' course:

Ancient or Modern Foreign Languages.counting 4 points

History, Foreign Languages, Mathe-

matics or Science..... " 5 "

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary Greek (page 31).....counting 3 points

Elementary History (see note, page 32) " 2 "

or " 1 point

Drawing (page 24)..... " 1 "

Music (page 36) " 1 "

Intermediate French (page 29)..... " 1 "

Intermediate German (page 30)..... " 1 "

Advanced English (page 27)..... " 1 "

Advanced Greek (page 31)..... " 1 "

Advanced History (page 32)..... " 1 "

Advanced Latin (page 34)..... " 1 "

Advanced Mathematics (page 36)..... " 1 "

Advanced Physics (page 38)..... " 1 "

and in the case of candidates for B.S. Degree:

Elementary Latin¹ (see note, page 34).. " 2 points

The candidate may offer not more than 4 points in all from the four subjects following:

Elementary French (page 28).....counting 2 points

Elementary German (page 29)..... " 2 "

Italian (page 33) " 2 "

Spanish (page 40)..... " 2 "

The candidate may offer not more than 2 points in all from the five subjects following, except candidates for B.S. degree who may offer 2 points or more without restriction:

Botany (page 23).....counting 1 point

Chemistry (page 24)..... " 1 "

Elementary Physics (page 38)..... " 1 "

Physiography (page 38)..... " 1 "

Zoölogy (page 40) " 1 "

TO ENTER THE COLLEGE OF PHYSICIANS AND SURGEONS

Total requirement.....15 points

The candidate *must* offer

English (page 25).....	counting 3 points
Elementary French (page 28)	
<i>or</i>	
Elementary German (page 29)	
Elementary Latin (see note, page 34) ..	" 2 "
Elementary Mathematics (page 35)....	" 3 "
Elementary Physics (page 38).....	" 1 point
Chemistry (page 24).....	" 1 "

and 13 points from the following, subject to the restriction that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary French	} counting 2 points
<i>or</i>	
Elementary German (see above)	
Elementary Greek (page 31).....	" 3 "
Elementary History (see note, page 32)	" 2 "
<i>or</i>	1 point
Elementary Latin (see note, page 34) ..	" 2 points
Botany (page 23).....	" 1 point
Drawing (page 24).....	" 1 "
Physiography (page 38).....	" 1 "
Spanish (page 40).....	" 2 points
Zoölogy (page 40).....	" 1 point
Intermediate French (page 29).....	" 1 "
Intermediate German (page 30).....	" 1 "
Advanced Greek (page 31).....	" 1 "
Advanced History (page 32).....	" 1 "
Advanced Latin (page 34)	" 1 "
Advanced Mathematics (page 36)....	" 1 "
Advanced Physics (page 38).....	" 1 "

TO ENTER THE COLLEGE OF PHARMACY

(University Course—leading to the degree of Pharmaceutical Chemist)

Total requirement.....12 points

The candidate *must* offer 12 points from the subjects following, subject to the restriction that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

English (page 25).....	counting 3 points
Elementary French (page 28).....	" 2 "
Elementary German (page 29).....	" 2 "
Elementary Greek (page 31).....	" 3 "
Elementary History (see note, page 32)	" 2 "
	or " 1 point
Elementary Latin (see note, page 34) ..	" 4 points
	or " 2 "
Elementary Mathematics (page 35)....	" 3 "
Elementary Physics (page 38).....	" 1 point
Intermediate French (page 29).....	" 1 "
Intermediate German (page 30).....	" 1 "
Advanced Greek (page 31).....	" 1 "
Advanced History (page 32).....	" 1 "
Advanced Latin (page 34).....	" 1 "
Advanced Mathematics (page 36).....	" 1 "
Advanced Physics (page 38).....	" 1 "
Botany (page 23).....	" 1 "
Chemistry (page 24).....	" 1 "
Drawing (page 24).....	" 1 "
Physiography (page 38).....	" 1 "
Spanish (page 40).....	" 2 points
Zoölogy (page 40).....	" 1 point

TO ENTER THE SCHOOLS OF MINES, ENGINEERING AND CHEMISTRY

Total requirement.....15 points

The candidate *must* offer:

Chemistry (page 24).....	counting 1 point
Drawing (page 24).....	" 1 "
Elementary French (page 28)	}..... " 2 points
or	
Elementary German (page 29)	
English (page 25).....	" 3 "
Mathematics (page 35).....	" 4 "
Physics (page 38).....	" 1 point

and 3 points from the following, subject to the restriction that to offer an advanced subject will involve offering either at the same time or earlier the corresponding elementary subject:

Elementary French	}..... counting 2 points
or	
Elementary German (see above)	
American History (see note, page 32).....	" 1 point
Ancient History (see note, page 32)....	" 1 "
English History (see note, page 32)...	" 1 "
Medieval and Modern History (see note, page 32).....	" 1 "
Elementary Latin (see note, page 34).....	" 2 points
Botany (page 23).....	" 1 point
Physiography (page 38).....	" 1 "
Shopwork (page 39).....	" 1 "
Spanish (page 40).....	" 2 points
Zoölogy (page 40).....	" 1 point
Intermediate French (page 29).....	" 1 "
Intermediate German (page 30).....	" 1 "
Advanced Physics (page 38).....	" 1 "

All candidates for degrees of Engineer of Mines, Metallurgical and Chemical Engineer or Chemist, are recommended to offer Elementary and Intermediate German.

Except for reasons of weight no student will be admitted with a condition in Mathematics, Chemistry, or Physics. It is suggested that candidates deficient in these subjects in June arrange to take courses in them in the Summer Session of Columbia University, the announcement of which will be sent upon application to the Secretary of the University.

Attention is called to the fact that the requirements for the Bachelor's degree and for a degree from one of the Schools of Mines, Engineering and Chemistry may both be fulfilled in six years or less. Candidates wishing to fulfil in this way the requirements for both degrees should first enter Columbia College.

TO ENTER THE SCHOOLS OF FINE ARTS.

(Courses Leading to certificates in Architecture, Music and Design.)

Total requirement.....10 points

SCHOOL OF ARCHITECTURE

The candidate *must* offer:

Elementary Mathematics (page 35).....counting 3 points

Drawing (page 24) " 1 point

and 6 points from the subjects following:

English (page 25)..... " 3 points

Elementary French (page 28)..... " 2 "

Elementary German (page 29)..... " 2 "

Elementary History (page 32)..... " 2 "

or " 1 point

Elementary Latin (see note, page 34)..... " 2 points

Elementary Physics (page 38)..... " 1 point

Chemistry (page 24)..... " 1 "

Spanish (page 40)..... " 2 points

Advanced Mathematics (page 36)..... " 1 point

Candidates are strongly recommended to include Elementary French and Advanced Mathematics among the subjects offered.

They will also be required to give evidence by examination, certificate, or duly certified work, of a practical knowledge of the orders of architecture, elementary projections, shades and shadows, architectural rendering in India ink and color, and of freehand drawing from the cast.

SCHOOL OF MUSIC

The candidate *must* offer:

English (page 25).....counting 3 points

and *one other language* (either French, or German, or Greek, or Latin or Italian—see below), and may offer any of the following, subject to the restriction that to offer an advanced subject will involve offering, either at the same time or earlier, the corresponding elementary subject:

Elementary French (page 28).....counting 2 points

Elementary German (page 29)..... " 2 "

Elementary Greek (page 31)..... " 3 "

Elementary History (page 32)..... " 2 "

or " 1 point

Elementary Latin (see note, page 34)..... " 2 points

Elementary Mathematics (page 35)..... " 3 "

Elementary Physics (page 38)..... " 1 point

Italian (page 33)..... " 2 points

Harmony (page 37)..... " 1 point

Musical Appreciation (page 36)..... " 1 "

Musical Performance (page 37)..... " 2 points

Advanced History (page 32).....counting 1 point
Advanced Mathematics (page 36)..... " 1 "

Candidates will also be required to give evidence of their ability to play, on the pianoforte, the Two-part Inventions of Bach.

SCHOOL OF DESIGN

The candidate *must* offer:

Drawing (page 24).....counting 1 point
English (page 25)..... " 3 points

and either Elementary French (page 28) .. }
or Elementary German (page 29) .. }
or Italian (page 33)..... }

and 4 points from the following, subject to the restriction that to offer an advanced subject will involve offering, either at the same time or earlier, the corresponding elementary subject:

either Elementary Greek (page 31).....counting 3 points

or Elementary Latin (see note, page 34)... " 2 "
Elementary History (page 32)..... " 2 "
or " 1 point
Elementary Mathematics (page 35)..... " 3 points
Elementary Physics (page 38)..... " 1 point
Chemistry (page 24)..... " 1 "
Advanced Mathematics (page 36)..... " 1 "

SUBMISSION OF NOTE-BOOKS, DRAWINGS, ETC.

All work submitted must be duly certified to in ink by the teacher in the following form:

"I certify that this is a true and original record of work actually performed bywhile in attendance at.....during the year 19.....

Instructor in.....

Drawings should bear a similar certification, or in case of work not done under instruction should be accompanied by the candidate's own signed declaration.

All note-books, unless otherwise specified, should be submitted at the time of examination. Candidates desiring their return should apply, for the June examinations to the Secretary of the College Entrance Examination Board; for the September and January examinations to the Secretary of the University.

English exercise books, submitted in lieu of examination, Advanced English essays or Advanced History and Advanced Physics note-books should be sent to the Secretary of the University *at least two weeks before* the examinations begin. Within ten days the candidate will be informed whether or not the work submitted has been accepted. English exercise books will *not* be returned to the writers.

DEFINITIONS OF REQUIREMENTS¹

(Specimens of the question papers set by Columbia University may be obtained from the Secretary upon application. The question papers set by the College Entrance Examination Board are published annually in book form by Ginn & Company, Boston, Mass.

For a more detailed statement of the requirements in Botany and Physiography the reader is referred to the pamphlet containing definitions of the requirements in each subject, which is published by the College Entrance Examination Board. This pamphlet also contains lists of suitable laboratory experiments in Chemistry and Physics.)

BOTANY (counting one point)

The candidate should have received training by means of the laboratory method in:

The structure and the more obvious features of the life history of at least ten types among the higher seed plants chosen from the more representative families (e. g., Gramineæ, Liliaceæ, Salicaceæ, Ranunculaceæ, Rosaceæ, Leguminosæ, Cruciferæ, Solanaceæ, Labiatæ, Compositæ). In addition to these, the following types are recommended among the remaining lower groups of plants: pine, *Selaginella*; a fern, a moss (*Polytrichum* or *Fu-naria*); a leafy hepatic, *Marchantia*; a mildew (*Microsphæra*); an agaric, *Vaucheria*, *Spirogyra*; and a protophyte (preferably *Sphærella*).

Physiology. This work should cover the essential facts concerning irritability, photosynthesis, respiration, digestion, growth, and reproduction.

Ecology. The natural history of plants should receive considerable attention, and the behavior of plants toward environmental factors (especially light and moisture), dissemination, cross and close pollination, and the more important structural and physiological characteristics of plant formations (hydrophytes, halophytes, mesophytes, and xerophytes) should be included.

As evidence of proper laboratory training and of satisfactory work, a note-book must be submitted. (See Submission of Note-books, page 22.)

¹ The several subjects are stated in terms of units; the unit is a course of five periods weekly throughout an academic year of the preparatory school; the subjects are assigned units in accordance with the time required to prepare adequately upon them for college entrance.

CHEMISTRY (counting one point)

The candidate's preparation in Chemistry should include:

- a. The study of a standard text-book, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws of elementary chemistry.
- b. Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c. Individual laboratory work, comprising at least forty exercises.

An indexed note-book of the experiments must be submitted. (See Submission of Note-books, page 22.)

The following outline includes only the indispensable things which must be studied in the class-room and laboratory. The material is, for the most part, common to all elementary text-books and laboratory manuals. The order of presentation will naturally be determined by each teacher for himself.

OUTLINE.—The chief physical and chemical characteristics, the preparation and the recognition of the following elements together with their principal compounds: *oxygen, hydrogen, carbon, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, silicon, potassium, sodium, calcium, magnesium, zinc, copper, mercury, silver, aluminum, lead, tin, iron, manganese, chromium*.

More detailed study should be confined to the italicized *elements* (as such) and to a restricted list of compounds such as water, hydrochloric acid, carbon-monoxide, carbon-dioxide, oxides of nitrogen, nitric acid, ammonia, sulphur-dioxide, sulphuric acid, hydrogen, sulphide, sodium-hydroxide, ammonium-hydroxide.

Attention should be given to the atmosphere (constitution and relation to animal and vegetable life), flames, acids, bases, salts, oxidation and reduction, crystallization, combining proportions by weight and volume, calculations founded on these and Boyle's and Charles's laws, symbols and nomenclature, atomic theory, atomic weights, valency (in a very elementary way), nascent state, natural grouping of the elements, solution (solvents and solubility of gases and solids and liquids, saturation), strength of acids and bases, conservation and dissipation of energy, chemical energy, electrolysis. Chemical terms should be clearly understood, and the pupil should be able to illustrate and apply the ideas they embody. The theoretical topics are not intended to form separate subjects of study, but to be taught only so far as is necessary for the correlation and explanation of the experimental facts.

DRAWING (counting one point)

The candidate's preparation in Drawing should include simple geometrical, plane, and solid figures, simple pieces of machinery, the drawing of simple pieces of architectural ornament (a Greek anthemion, a design of iron scrollwork, etc.), the copying of machinery details, or the copying of still life and simple plant forms, with a fair knowledge

of perspective and light and shade as applied in freehand sketching. The candidate should be able to reproduce from a flat copy with enlargement or reduction of size.

Every candidate must present at the time of and as part of the examination in drawing a set of drawings executed during one year's course in a preparatory school and within a period of two years before the time of application for admission.

These drawings should be at least twenty in number and should display the proficiency of the student in the following points:

1. Ability to sketch freehand from dictation with reasonable accuracy and with fairly correct steady and clean lines any simple geometrical figure or combinations of figures, straight lines, squares and circles, polygons, spirals, or the like.

2. Ability to sketch from the object, with reasonable correctness of proportion, structure, and form, geometrical models, simple vases, simple details of machinery or common objects such as ordinary household furniture and utensils.

3. Ability to sketch from the copy, enlarging or reducing its dimensions, any simple object such as a globe valve, stop-cock, or any ordinary historical ornament such as an acanthus leaf, egg and dart ornament, anthemion, tile pattern, iron scrollwork or the like.

Correctness of proportion and accuracy in the angles and curves and structural relations of the parts of every figure or object drawn are of the highest importance, and great care should be taken in laying out the drawings in the use of construction lines and in the drawing of general masses and contour before the details are begun.

A certain proportion of shade drawing from casts may be included, but they are not required and should not form the majority of the drawings submitted.

All drawings should be of uniform size, and fastened together, not rolled.

In case the candidate has not attended a systematic course of instruction as detailed above he may submit a corresponding set of freehand drawings. (See Submission of Note-books, page 22.)

ENGLISH

Elementary (counting three points)

No applicant will be accepted in English whose work is notably defective in point of spelling, grammar, idiom, punctuation, or division into paragraphs.

a. Reading and Practice.—The form of examination will usually be the writing of a paragraph or two on each of several topics, to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to show the candidate's power of clear and accurate expression, and will call for only a general knowledge of the substance of the books. In

every case knowledge of the book will be regarded as less important than the ability to write good English. In place of a part or the whole of this test, the candidate may present an exercise book, properly certified by his instructor, containing compositions or other written work done in connection with the reading of the books, and prepared in accordance with a list of directions, to be obtained by addressing the Secretary of the University. (See Submission of Note-books, page 22.) In preparation for this part of the requirement, it is important that the candidate shall have been instructed in the fundamental principles of rhetoric.

Candidates intending to take this part of the examination should read the books prescribed for the year in which they propose to submit themselves for examination in this subject.

In 1908 the books prescribed for this part of the examination are as follows:

Shakspere's Merchant of Venice and Macbeth; The Sir Roger de Coverley Papers in the Spectator; Irving's Life of Goldsmith; Coleridge's Ancient Mariner; Scott's Ivanhoe and The Lady of the Lake; Tennyson's Gareth and Lynette, Launcelot and Elaine, and The Passing of Arthur; Lowell's Vision of Sir Launfal; George Eliot's Silas Marner.

In 1909, 1910, and 1911 ten books, selected from the following list as prescribed below, are to be offered for examination:

Group I (two to be selected). Shakspere's As You Like It, Henry V, Julius Cæsar, The Merchant of Venice, Twelfth Night.

Group II (one to be selected). Bacon's Essays; Bunyan's The Pilgrim's Progress, Part I; The Sir Roger de Coverley Papers in the Spectator; Franklin's Autobiography.

Group III (one to be selected). Chaucer's Prologue; Spenser's Faerie Queene (selections); Pope's The Rape of the Lock; Goldsmith's The Deserted Village; Palgrave's Golden Treasury (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns.

Group IV (two to be selected). Goldsmith's The Vicar of Wakefield; Scott's Ivanhoe; Scott's Quentin Durward; Hawthorne's The House of the Seven Gables; Thackeray's Henry Esmond; Mrs. Gaskell's Cranford; Dickens's A Tale of Two Cities; George Eliot's Silas Marner; Blackmore's Lorna Doone.

Group V (two to be selected). Irving's Sketch-Book; Lamb's Essays of Elia; De Quincey's Joan of Arc and The English Mail Coach; Carlyle's Heroes and Hero Worship; Emerson's Essays (Selected); Ruskin's Sesame and Lilies.

Group VI (two to be selected). Coleridge's The Ancient Mariner; Scott's The Lady of the Lake; Byron's Mazeppa and The Prisoner of Chillon; Palgrave's Golden Treasury (First Series), Book IV, with especial attention to Wordsworth, Keats, and Shelley; Macaulay's Lays of Ancient Rome; Poe's Poems;

Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Launcelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Hervé Riel*, *Pheidippides*.

b. Study and Practice.—This part of the examination presupposes the thorough study of each of the works named below. The examination will be upon subject-matter, form, and structure. In addition, the candidate may be required to answer questions involving the essentials of English grammar, and questions on the leading facts in those periods of English literary history to which the prescribed works belong.

In connection with the reading and study of the required books, parallel or subsidiary reading should be encouraged, and a considerable amount of English poetry should be committed to memory. The essentials of English grammar should not be neglected in preparatory study.

The books prescribed for this part of the examination are as follows:

In 1908: Shakspere's *Julius Cæsar*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*; Macaulay's *Essay on Addison* and *Life of Johnson*.

In 1909, 1910, and 1911: Shakspere's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

Advanced (counting one point)

The requirement in advanced English is the equivalent of English **A1-A2**, the course prescribed for freshmen. Candidates are examined in the following subjects:

1. English composition, with special attention to correctness of style and to orderly arrangement of material. In preparation for this part of the examination, the student should gain a practical acquaintance with the principles of rhetoric as expounded in any good text-book.

2. English literature—the general history from the Anglo-Saxon period to the death of Tennyson, and selected works from the Elizabethan period to the present day. The selected works are: Marlowe's *Edward II.*; Shakspere's *Hamlet*; Milton's *Paradise Lost* (Books 1, 2, 3, and 6); Dryden's *Essay of Dramatic Poesy*; Swift's *The Battle of the Books*; Pope's *Iliad* (Books 1, 6, 22, and 24); Goldsmith's *She Stoops to Conquer*; Byron's *Childe Harold*; Webster's *Reply to Hayne*; Dickens's *Old Curiosity Shop*.

In examination the candidate will be expected to answer questions on the history of English literature and to write short essays based on topics relating to the works prescribed. In addition, he must submit not less than ten essays of at least 500 words each. At least half, but not all, of these essays should be on topics chosen from the books prescribed. (See Submission of Note-books, page 22.)

FRENCH.

a. Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course the pupil should be able to pronounce French accurately, to read at sight easy French prose, to put into French simple English sentences taken from the language of everyday life, or based upon a portion of the French text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural of nouns, the inflection of adjectives, participles, and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix in the memory the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practice in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of easy modern prose in the form of stories, plays, or historical or biographical sketches; (2) constant practice, as in the previous year, in translating into French easy variations upon the texts read; (3) frequent abstracts, sometimes oral and sometimes written, of portions of the text already read; (4) writing French from dictation; (5) continued drill upon the rudiments of grammar, with constant application in the construction of sentences; (6) mastery of the forms and use of pronouns, pronominal adjectives, of all but the rare irregular verb forms, and of the simpler uses of the conditional and subjunctive.

Suitable texts for the second year are: About's *Le roi des montagnes*, Bruno's *Le tour de la France*, Daudet's easier short tales, La Bédolière's *La Mère Michel et son chat*, Erckmann-Chatrian's stories, Foa's *Contes biographiques* and *Le petit Robinson de Paris*, Foncin's *Le pays de France*, Labiche and Martin's *La poudre aux yeux* and *Le voyage de M. Perrichon*, Legouvé and Labiche's *La cigale chez les fourmis*, Malot's *Sans famille*, Mairet's *La tâche du petit Pierre*, Mérimée's *Colomba*, extracts from Michelet, Sarcey's *Le siège de Paris*, Verne's stories.

b. Intermediate (counting one point)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight ordinary French prose or simple poetry, to translate into French a connected passage of English based on the text read, and to answer questions involving a more thorough knowledge of syntax than is expected in the elementary course.

THE WORK TO BE DONE.—This should comprise the reading of from 400 to 600 pages of French of ordinary difficulty, a portion to be in the dramatic form; constant practice in giving French paraphrases, abstracts, or reproductions from memory of selected portions of the matter read; the study of a grammar of moderate completeness; writing from dictation.

Suitable texts are: About's stories, Augier and Sandeau's *Le gendre de M. Poirier*, Béranger's poems, Corneille's *Le Cid* and *Horace*, Coppée's poems, Daudet's *La Belle-Nivernaise*, La Brète's *Mon oncle et mon curé*, Madame de Sévigné's letters, Hugo's *Hernani* and *La chute*, Labiche's plays, Loti's *Pêcheur d'Islande*, Mignet's historical writings, Molière's *L'avare* and *Le bourgeois gentilhomme*, Racine's *Athalie*, *Andromaque*, and *Esther*, George Sand's plays and stories, Sandeau's *Mademoiselle de la Seiglière*, Scribe's plays, Thierry's *Récits des temps merovingiens*, Thiers's *L'expédition de Bonaparte en Egypte*, Vigny's *La canne de jonc*, Voltaire's historical writings.

GERMAN

a. Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course in German the pupil should be able to read at sight, and to translate, if called upon, by way of proving his ability to read, a passage of very easy dialogue or narrative prose, help being given upon unusual words and constructions, to put into German short English sentences taken from the language of everyday life or based upon the text given for translation, and to answer questions upon the rudiments of grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill upon pronunciation; (2) the memorizing and frequent repetition of easy colloquial sentences; (3) drill upon the rudiments of grammar—that is, upon the inflection of the articles, of such nouns as belong to the language of everyday life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word-order; (4) abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (5) the reading of from 75 to 100 pages of graduated texts from a reader, with constant practice in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English), and in the reproduction from memory of sentences previously read.

During the second year the work should comprise: (1) the reading of from 150 to 200 pages of literature in the form of easy stories and plays; (2) accompanying practice, as before, in the translation into German of easy variations upon the matter read, and also in the off-hand reproduction, sometimes orally and sometimes in writing, of the substance of short and easy selected passages; (3) continued drill upon the rudiments of the grammar, directed to the ends of enabling the pupil, first, to use his knowledge with facility in the formation of sentences, and, secondly, to state his knowledge correctly in the technical language of grammar.

Stories suitable for the elementary course can be selected from the following list: Andersen's *Märchen* and *Bilderbuch ohne Bilder*; Arnold's *Fritz auf Ferien*; Baumbach's *Die Nonna* and *Der Schwiegersohn*; Gerstäcker's *Germelshausen*; Heyse's *L'Arrabbiata*, *Das Mädchen von Treppi*, and *Anfang und Ende*; Hillern's *Höher als die Kirche*; Jensen's *Die braune Erica*; Leander's *Träumereien* and *Kleine Geschichten*; Seidel's *Märchen*; Stökl's *Unter dem Christbaum*; Storm's *Immensee* and *Geschichten aus der Tonne*; Zschokke's *Der zerbrochene Krug*.

Among the shorter plays the best available are perhaps Benedix's *Der Prozess*, *Der Weiberfeind*, and *Günstige Vorzeichen*; Elz's *Er ist nicht eifersüchtig*; Wichert's *An der Majorsecke*; Wilhelmi's *Einer muss heiraten*. It is recommended, however, that not more than one of these plays be read. The narrative style should predominate. A good selection of reading matter for the second year would be Andersen's *Märchen*, or *Bilderbuch*, or Leander's *Träumereien*, to the extent of, say, forty pages. After that such a story as *Das kalte Herz*, or *Der zerbrochene Krug*; then *Höher als die Kirche*, or *Immensee*; next a good story by Heyse, Baumbach, or Seidel; lastly, *Der Prozess*.

b. Intermediate (counting one point)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight German prose of ordinary difficulty, whether recent or classical; to put into German a connected passage of simple English, paraphrased from a given text in German; to answer any grammatical questions relating to usual forms and essential principles of the language, including syntax and word-formation; and to translate and explain (so far as explanation may be necessary) a passage of classical literature taken from some text previously studied.

THE WORK TO BE DONE.—The work should comprise, in addition to the elementary course, the reading of about 400 pages of moderately difficult prose and poetry, with constant practice in giving, sometimes orally and sometimes in writing, paraphrases, abstracts, or reproductions from memory of selected portions of the matter read; also grammatical drill upon the less usual strong verbs, the use of articles, cases, auxiliaries of all kinds, tenses, and modes (with special reference to the infinitive and subjunctive), and likewise upon word-order and word-formation.

The intermediate course is supposed to be the elementary course plus one year's work at the rate of not less than four recitations a week. Suitable reading matter for the third year can be selected from such works as the following: Ebner-Eschenbach's *Die Freiherren von Gemperlein*; Freytag's *Die Journalisten* and *Bilder aus der deutschen Vergangenheit*—for example, *Karl der Grosse*, *Aus den Kreuzzügen*, *Doktor Luther*, *Aus dem Staat Friedrichs des Grossen*; Fouqué's *Undine*; Gerstäcker's *Irrefahrten*; Goethe's *Hermann und Dorothea* and *Iphigenie*; Heine's poems and *Reisebilder*; Hoffmann's *Historische Erzählungen*; Lessing's *Minna von Barnhelm*; Meyer's *Gustav Adolfs Page*; Moser's *Der Bibliothekar*; Riehl's *Novellen*—for example, *Burg Neideck*, *Der Fluch der Schönheit*, *Der stumme Ratsherr*, *Das Spielmannskind*; Rosegger's *Waldheimat*; Schiller's *Der Neffe als Onkel*, *Der Gersterseher*, *Wilhelm Tell*, *Die Jungfrau von Orleans*, *Das Lied von der Glocke*, *Balladen*; Scheffel's *Der Trompeter von Säkkingen*; Uhland's poems; Wildenbruch's *Das edle Blut*.

GREEK

Elementary (counting three points)

a. i. Grammar.

The common forms, idioms, and constructions, and the general grammatical principles of Attic Greek prose.

ii. Elementary Prose Composition.

Translation into Greek of detached sentences to test the candidate's knowledge of grammatical constructions.

The examination in the two subjects immediately preceding will be based on the first two books of Xenophon's *Anabasis*.

Greek a. i. and ii. is considered a single, indivisible subject.

b. Xenophon.

The first four books of the *Anabasis*.

c. Homer.

The first three books of the *Iliad* (omitting II, 494-end) and the constructions, poetical forms, and prosody of Homer's *Iliad*.

f. Prose Composition.

Translation into Greek of continuous prose based on Xenophon and other Attic prose of similar difficulty.

g. Sight Translation.

Translation into English at sight, based on prose of no greater difficulty than Xenophon's *Anabasis*.

Advanced (counting one point)

Candidates offering Greek as an advanced subject must present the equivalent of the course known as Greek 3-4 (see courses announced by the Division of Classical Philology). In Homer, for which no equivalent will ordinarily be accepted, the minimum requirement will be 1600 lines in addition to the amount offered for the elementary examination. The candidate must also offer the eight orations of Lysias in Morgan's edition, or an equivalent amount of similar Greek, and in prose composition at least twenty exercises in the writing of

connected narrative prose. The exercises in Part III of Allinson's Greek Prose Composition will show the grade of preparation demanded. Candidates applying for examination in this subject must designate the equivalents, if any, which they wish to offer.

HISTORY

Elementary (counting two points)

NOTE.—Each of the four divisions, *a*, *b*, *c*, and *d*, counts one point. Candidates for admission to the Schools of Mines, Engineering and Chemistry may offer one or more of the divisions without restriction. All other candidates may offer any one or any two of the divisions without restriction.

- a.* Ancient history, including a brief introductory study of the Oriental peoples, and early mediæval history to the death of Charlemagne, with due reference to art, literature, and government.
- b.* Mediæval and modern history, from the death of Charlemagne to the present time, with due reference to the growth of the state-system.
- c.* English history, with due reference to social and political development.
- d.* American history, with the elements of civil government.

On examination a candidate must show such general knowledge of the subject in each division offered as may be acquired from the study of an accurate text-book of not less than three hundred pages. Since the questions will be so framed as to require comparison and the use of judgment rather than mere exercise of memory on the part of the pupil, it is recommended that the teacher prescribe a course of supplementary reading of not less than three hundred pages dealing with the more important periods and events in each division offered. Geographical knowledge will be tested by requiring the location of places, boundaries and movements on an outline map.

Advanced (counting one point)

The requirement in advanced history is intended to be an equivalent for History **A1-A2**—the course prescribed in Columbia College (see courses given by Department of History). The work done at school, therefore, should be substantially identical with that course, the nature of which is explained in a syllabus that may be obtained at the University Bookstore. Those candidates who desire to offer history as an advanced subject must have offered for elementary history either *a and b* or *c and d*, and must present themselves for examination upon the two divisions *which they did not offer as an elementary subject*. The examination will presuppose superior ability on the part of the candidate to understand the significance of historical events, movements, or tendencies, to discern similarities and contrasts, and to combine results. Especial care should be exercised,

therefore, in the selection of the supplementary reading on the more important periods and events in each of the two divisions.

As further evidence of proficiency, satisfactory written work must be presented in the form of a note-book, or bound collection of notes (see Submission of Note-books, page 22), which must contain not less than five thousand words on each division offered, and must show practice in at least three of the following exercises:

- (a) Notes and digests of reading outside of the text-books.
- (b) Written recitations requiring the use of judgment, and the application to new questions of knowledge already gained.
- (c) Written parallels between historical characters, events, or periods.
- (d) Brief studies of topics limited in scope, prepared outside the classroom and illustrated by some reference to contemporary material.
- (e) Historical maps or charts showing explorations, migrations, conquests, territorial changes, or social phenomena.

ITALIAN

Elementary (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the course the pupil should be able to pronounce Italian accurately, to read at sight easy Italian prose, to put into Italian simple English sentences taken from the language of everyday life, or based upon a portion of the Italian text read, and to answer correctly questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the conjugation of the regular and the more common irregular verbs, the inflection of nouns, adjectives, and pronouns, and the elementary rules of syntax; (3) abundant exercises illustrating the principles of grammar; (4) the reading and accurate rendering into good English of from 100 to 175 duodecimo pages of graduated texts, with translation into Italian of easy variations of the sentences read; (5) writing Italian from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of modern prose from different authors and of easy poetry; (2) practice in translating Italian into English, and English variations of the text into Italian; (3) continued study of the elements of grammar and of syntax; (4) mastery of all but the rare irregular verb-forms and of the simpler uses of the moods and tenses; (5) writing Italian from dictation.

Suitable texts for the second year are; E. DeAmicis' *Cuore*; G. Giacosa's *Acquazzone in montagna*; P. Zambri's *Il caporale di setimana*; G. Gozzi's *Poesie e prosce, scelte da A. Pippi*; G. C. Abba's *Da Quarto al Volturino*; Guido Zalorsi's *Guardare e pensare*; S. Zarira's *Il Signor Io*; A. Stoppani's *Il bel paese*.

LATIN
Elementary (counting four points)

NOTE.—To secure four points candidates must offer *a*, *c*, *d*, *l*, and *m* except candidates for admission to the College of Physicians and Surgeons and the College of Pharmacy, who may offer *b* (Cæsar) as a substitute for either *c* or *d*.

Candidates for admission to Columbia College (course leading to B.S. degree), the College of Physicians and Surgeons, or the College of Pharmacy, who are unable to offer the whole of Elementary Latin, will be permitted to offer two points from this subject. Such candidates must offer parts *a* and *c*, or *a* and *d*, except candidates for the College of Physicians and Surgeons or the College of Pharmacy, who must offer *a* and either *b* or *c* or *d*.

To secure two points candidates for admission to Barnard College (course leading to B.S. degree) or the Schools of Music and Design (courses leading to a certificate in Music or Design must offer *a* and either *c* or *d*; and candidates for admission to the Schools of Mines, Engineering and Chemistry or the School of Architecture (course leading to a certificate in Architecture) must offer *a* and either *b* or *c* or *d*.

a. i. Grammar.

The inflections; the simpler rules for composition and derivation of words; syntax of cases and verbs; structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse, and the subjunctive.

ii. Elementary prose composition.

Translation into Latin of detached sentences and very easy, continuous prose based upon Cæsar and Cicero.

Latin *a. i.* and *ii.* is considered a single, indivisible subject.

b. Cæsar. (See Note above.)

Any four books of the Gallic War, preferably the first four.

c. Cicero.

Any six orations from the following list, but preferably the first six mentioned:

The four orations against Catiline, Archias, and the Manilian Law, Marcellus, Roscius, Milo, Sestius, Ligarius, the Fourteenth Philippic.

d. Vergil.

The first six books of the Æneid, and so much of prosody as relates to accent, versification in general, and the dactylic hexameter.

Prose composition.

Translation into Latin of continuous prose of moderate difficulty based on Cicero.

m. Elementary Sight Translation.

Translation into English at sight, based exclusively on prose of no greater difficulty than the easier parts of Cicero's orations.

Advanced (counting one point)

Candidates offering Latin as an advanced subject must present the

equivalent of the course known as Latin A1-A2 (see courses announced by the Division of Classical Philology). In Horace, for which no equivalent will ordinarily be accepted, the minimum requirement will be the first and third books of the Odes, with a satisfactory knowledge of the prosody. The candidate must offer also the twenty-first book of Livy entire and chapters 41-53 inclusive of the twenty-second book, and in prose composition twenty exercises from Part I of Gildersleeve and Lodge's Prose Composition.

Candidates applying for examination in this subject must designate the equivalents, if any, which they wish to offer.

MATHEMATICS

Elementary (counting three points)

a. Elementary algebra.

i. The four fundamental operations for rational algebraic expressions.

Factoring, determination of highest common factor and lowest common multiple by factoring.

Fractions; including complex fractions, ratio and proportion.

Linear equations, both numerical and literal, containing one or more unknown quantities.

Problems depending on linear equations.

Radicals, including the extraction of the square root of polynomials and of numbers.

Exponents, including the fractional and negative.

ii. Quadratic equations, both numerical and literal.

Simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations.

Problems depending upon quadratic equations.

The binomial theorem for positive integral exponents.

The formulas for the n th term and the sum of the terms of arithmetic and geometric progressions, with applications.

It is assumed that pupils will be required throughout the course to solve numerous problems which involve putting questions into equations. Some of these problems should be chosen from mensuration, from physics, and from commercial life. The use of graphical methods and illustrations, particularly in connection with the solution of equations, is also expected.

c. Plane geometry.

The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons, and the measurement of the circle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of lines and plane surfaces.

Advanced (counting one point)

d. Solid geometry.

The usual theorems and constructions of good text-books; including the relations of planes and lines in space; the properties and measurements of prisms, pyramids, cylinders, and cones; the sphere and the spherical triangle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of surfaces and solids.

e. Trigonometry.

Definitions and relations of the six trigonometric functions as ratios; circular measurement of angles.

Proofs of principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, of the double angle and the half angle, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas.

Solution of trigonometric equations of a simple character.

Theory and use of logarithms (without the introduction of work involving infinite series).

The solution of right and oblique triangles, and practical applications, including the solution of right spherical triangles.

MUSIC

NOTE.—A candidate for admission to Columbia College may offer either *a* or *b*. A candidate for admission to the School of Music (courses leading to a certificate in Music) may offer either *a* or *b* or both.

a. Musical Appreciation (counting one point)

The candidate is expected to have:

(1) A general knowledge of the principal musical forms—song, classic dance, fugue, sonata (all movements), symphony—and of their historical development;

(2) A general knowledge of the lives and environment of at least ten composers, including Bach, Mozart, Beethoven, Schubert, Chopin, and five of the following: Purcell, Handel, Gluck, Haydn, Cherubini, Weber, Rossini, Glinka, Mendelssohn, Schumann, Wagner, Verdi;

(3): Familiarity with certain designated works. The works set for 1908 and 1909 are:

Bach: Prelude I and Fugue I from Well-Tempered Clavichord.

 Gavotte from Sixth Violoncello Suite.

Handel: Air with Variations ("The Harmonious Blacksmith")

¹ The examination in (3) will be held only in September and January, and will be open only to candidates who have passed the examinations in (1) and (2).

<i>Haydn:</i>	Largo from String Quartet (op. 74, No. 3).
<i>Mozart:</i>	Overture to "The Magic Flute."
	Symphony in G Minor (entire).
<i>Beethoven:</i>	Sonata Pathétique (op. 13, entire).
	Larghetto from Second Symphony.
	Allegro con Brio from Fifth Symphony.
<i>Weber:</i>	Overture to "Der Freischütz."
<i>Schubert:</i>	Moment Musical in F Minor (op. 94, No. 3).
	Song, "The Erl-King."
	Song "Hark, Hark, the Lark."
<i>Mendelssohn:</i>	Scherzo from "Midsummer Night's Dream."
	"Spinning Song" (op. 67, No. 4).
<i>Chopin:</i>	Polonaise (op. 40, No. 1).
	Nocturne (op. 37, No. 2).
<i>Schumann:</i>	"Aufschwung" (op. 12, No. 2).
	Song, "Im wunderschönen Monat Mai."
<i>Wagner:</i>	Overture to "Tannhäuser."
	Siegfried's Funeral March, from "Götterdämmerung."

In the examination in (3) the candidate will be expected to identify characteristic portions of the works set, when played by the examiner; and to give intelligent information concerning the form and character of the works themselves. The test will not require ability to perform nor to read from printed music.

b. Harmony (counting one point)

The candidate should have acquired:

(1) The ability to harmonize, in four vocal parts, simple melodies of not fewer than eight measures, in soprano or in bass—these melodies will require a knowledge of triads and inversions, of diatonic seventh chords and inversions, in the major and minor modes; and of modulation, transient or complete, to nearly-related keys;

(2) Analytical knowledge of ninth chords, all non-harmonic tones, and altered chords (including augmented chords). [Students are encouraged to apply this knowledge in their harmonization.]

It is urgently recommended that systematic ear-training (as to interval, melody, and chord) be a part of the preparation for this examination. Simple exercises in harmonization at the pianoforte are recommended. The student will be expected to have a full knowledge of the rudiments of music, scales, intervals, and staff-notation, including the terms and expression-marks in common use.

Musical Performance (counting 2 points)

Candidates desiring to offer this subject should communicate with

the School of Music to ascertain the scope of the work and to arrange for the necessary examination.

PHYSICS

Elementary (counting one point)

The candidate's preparation in physics should include:

- a. The study of a standard text-book supplemented by the use of many varied numerical problems, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws in elementary physics.
- b. Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c. Individual laboratory work, comprising at least thirty-five exercises distributed about as follows: mechanics 13, sound 3, heat 5, light 6, electricity 8. An indexed note-book of the experiments must be submitted. (See Submission of Note-books, page 22.)

Advanced (counting one point)

Candidates offering physics as an advanced subject must have studied physics for a full year after satisfactorily completing the elementary requirement, and must present two note-books, the one being an outline of the class-room work and the other a record of laboratory experiments performed by the candidate. (See Submission of Note-Books, page 22.) The class-room work must be devoted to a more thorough and extensive study of the subjects previously covered in a general way and in its scope must correspond to one of the two courses known as Physics 5-6 or 7-8. (See courses in Physics in the Columbia College Announcement.)

The laboratory work must consist of at least thirty experiments on the subjects discussed in the class-room work. The experiments should be of a more advanced grade than those designed for the elementary requirement.

PHYSIOGRAPHY (counting one point)

NOTE.—This is identical with the subject called Geography by the College Entrance Examination Board.

The candidate's preparation in physiography should include the study of one of the modern text-books by Davis, Tarr, Dryer, or Gilbert and Brigham, together with an approved laboratory and field course of at least forty exercises actually performed by the candidate. Each division of the subject should receive approximately the same proportion of attention in the laboratory as in the class work. It is suggested that the exercises be divided somewhat as follows: Earth as a Globe, 5; Ocean, 5; Atmosphere, 12; Land, 18. An indexed note-book containing the record of these exercises must be submitted. (See Submission of Note-books, page 22.)

SHOPWORK (counting one point)

The candidate may offer any one of the following subjects:

- a.* Wood-work.
- b.* Forging.
- c.* Machine-work.

The candidate should have received laboratory instruction amounting to at least 180 hours in the subject offered, and will be required to pass both a written and a laboratory examination. The written examination will deal with the use and structure of tools, the nature of the usual shop processes and methods of work, and the properties of the materials commonly used in construction. The laboratory examination will consist of a practical test in the use of tools. The working drawing of some piece of work will be given the candidate, and he will be expected to select his tools and carry through all processes necessary for a finished result. As evidence of technical skill, the models made at school may be presented. They must be accompanied by a certificate from the instructor stating that they are the pupil's own work.

The following indicates the scope of the examinations:

- a.* Wood-work.

- i.* Joinery—Skill in the use of the ordinary carpenter's tools will be required and ability to sketch and describe their parts. The candidate will be expected to know the correct steps to pursue in laying out and finishing a simple piece of work. He will also be called upon to make the common joints and splices and to represent them by sketches. He should also be able to recognize the common varieties of wood, and to indicate their relative strength, hardness, character of grain, and tendency to warp.
- ii.* Turning and Pattern-Making—Ability in straight and simple curved turning both in hard and soft woods will be required, as well as a knowledge of the various methods of holding work in the lathe. The candidate should understand the requirements in making simple patterns and be able to describe the way in which such patterns are moulded.

- b.* Forging.

The candidate should have had practice in drawing, upsetting, forming, bending, and welding of iron and in forming, hardening, and tempering of steel. He should be able to describe the difference in appearance and in physical properties of wrought iron, soft steel, and tool steel, and state some of the uses to which each is put. He should be able to show the construction of the forge by sketches and indicate the proper handling of a piece in the fire.

- c.* Machine-Work.

The candidate should have had experience both in chipping and filing cast and wrought iron and steel, and in the simpler processes performed on small engine lathes, drills, planers, shapers,

and milling machines. He should be able to describe the mechanical construction of such tools and the operation of the different parts. He should also be able to indicate the correct methods of securing the pieces to be operated upon, and of adjusting the tool for a given result.

SPANISH (counting two points)

THE AIM OF THE INSTRUCTION.—At the end of the course the pupil should be able to pronounce Spanish accurately, to read at sight easy Spanish prose, to put into Spanish simple English sentences taken from the language of everyday life, or based upon a portion of the Spanish text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the conjugation of the regular and the more common irregular verbs, the inflection of nouns, adjectives, and pronouns, and the elementary rules of syntax; (3) exercises containing illustrations of the principles of grammar; (4) the reading and accurate rendering into good English of from 100 to 175 duodecimo pages of graduated texts, with translation into Spanish of easy variations of the sentences read; (5) writing Spanish from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of modern prose from different authors; (2) practice in translating Spanish into English, and English variations of the text into Spanish; (3) continued study of the elements of grammar and syntax; (4) mastery of all but the rare irregular verb-forms and of the simpler uses of the moods and tenses; (5) writing Spanish from dictation.

Suitable texts for the second year are: Valera's *El pájaro verde*; Alarcón's *El final de Norma*, *El capitán Veneno*; Valdés's *José*; Galdós's *Doña Perfecta*; *Marianela*; Padre Isla's version of *Gil Blas*; Carrion and Aza's *Zaragüeta*.

ZOOLOGY (counting one point)

OUTLINE FOR THE ONE-POINT OPTION IN ZOOLOGY.—The following outline includes the principles of zoölogy which are indispensable to a general survey of the science. It is planned for a full year's course. It is not intended to indicate order of study of the topics—this must be left to the teacher and the text-book.

1. The general natural history—including general external structure in relation to adaptations, life histories, geographical range, relations to other plants and animals, and economic relations—of common vertebrates and invertebrates so far as representatives of these groups are obtainable in the locality where the course is given. The types suggested are a mammal, bird, lizard, snake, turtle, newt, frog, dog-fish or shark, bony fish, clam, snail, starfish, earthworm, planarian, hydra, sea-anemone, paramoëcium. In the case of arthropods, pupils should become familiar with common crustaceans, spiders, myriapods.

and insects representing at least five orders. Actual examination of common animals with reference to the above points should be supplemented by reading giving natural-history information.

It is not expected that there will be time for making extensive note-books on the natural-history work; rather will the work in this line take the form of laboratory demonstrations. So far as time permits drawings and notes should be made. The note-book mentioned below should contain at least drawings on the external structure of four animals not studied under Section 3, preferably two insects, a mollusk, and a second vertebrate.

2. The classification of animals into phyla and leading classes (except the modern subdivisions of the worms) and the great characteristics of these groups. In the case of insects and vertebrates the characteristics of the prominent orders. The teaching of classification should be by practical work so as to train the pupil to recognize animals and to point out the chief taxonomic characteristics. The meaning of species, genera, and larger groups should be developed by constructive practical work with representatives of insect or vertebrate orders.

3. The general plan of external and internal structure, not the anatomical minutiae, of one vertebrate (preferably frog or fish) in general comparison with human body; an arthropod (preferably a decapod); an annelid (earthworm or *Nereis*); a coelenterate (hydroid, hydra or sea-anemone); a protozoön (a ciliate, and ameba when possible). In place of any of above types not locally available there may be substituted a second vertebrate, an insect, a mollusk, or an echinoderm. Tissues, the study of which is recommended as optional,¹ should be examined first with the unaided eye, in such a structure as a frog's leg, and then with a microscope demonstrate the relations of cells and intercellular substance in epithelium and cartilage; and, if possible, in other tissues. The functions of the chief tissues and their positions in the body of a vertebrate should be pointed out.

4. (a) The general physiology of above types, involving the essentials of digestion, absorption, circulation (respiration), cell-metabolism, secretion, excretion, and nervous functions. This should apply comparatively the essentials of elementary work in human physiology. Demonstrations and experiments, such as are suggested in high-school text-books on human physiology, should be introduced, or recalled if not previously well presented in elementary physiology, in connection with the discussion of the chief functions. As far as practicable structure and function should be studied together.

(b) Comparison of the general life-processes in animals and plants (in connection with botany if zoölogy is first studied).

5. The very general features of asexual reproduction of a protozoön (preferably *Paramaecium*); alteration of generations in hydroids; reproduction and regenerations of *Hydra*; the very general external features of embryological development in a fish or frog; and (*optional*)

¹ Topics marked "optional" are regarded as *desirable* for the best high-school zoölogy, but will not be required in examinations.

the general cellular nature (not centrosomes and the like) of germ-cells, fertilization and cell-division in developing eggs should, as far as possible, be demonstrated and briefly described. Also, the most interesting features of development should be pointed out in the case of other animals studied.

6. The prominent evidences of relationship, suggesting evolution within such groups as the decapods, the insects, and the vertebrates, should be demonstrated. A few facts indicating the struggle for existence, adaptation to environment, variations of individuals and man's selective influence should be pointed out; but the factors of evolution and the discussion of its theories should not be attempted.

7. (*Optional*) Some leading facts regarding the epoch-making discoveries of biological history and the careers of such eminent naturalists as Darwin, Huxley, Pasteur, and Agassiz should be presented.

The above outline of a course in general zoölogy should be developed on the basis of a course of laboratory study guided by definite directions. This should be supplemented by the careful reading of at least one modern elementary text-book in general zoölogy. At least two thirds of the time should be devoted to the practical studies of the laboratory. If good nature-studies have not preceded the course in high-school zoölogy, pupils should be encouraged to do supplementary work in the line of natural history. A note-book with carefully labelled outline drawings of the chief structures studied anatomically (Section 3), and the drawings mentioned under natural history (Section 1), and with notes on demonstrations and in explanation of drawings, with dates and an index, must be submitted. It will be graded as one third of the examination. (See Submission of Note-books, page 22.)

CIRCULARS OF INFORMATION

For information as to tuition fees, scholarships, curriculum, and scheme of attendance, application should be made to the Secretary of the University for such circulars of information as are necessary. The following are distributed without charge:

Announcement of Columbia College

Announcement of Barnard College

Announcement of the College of Physicians and Surgeons

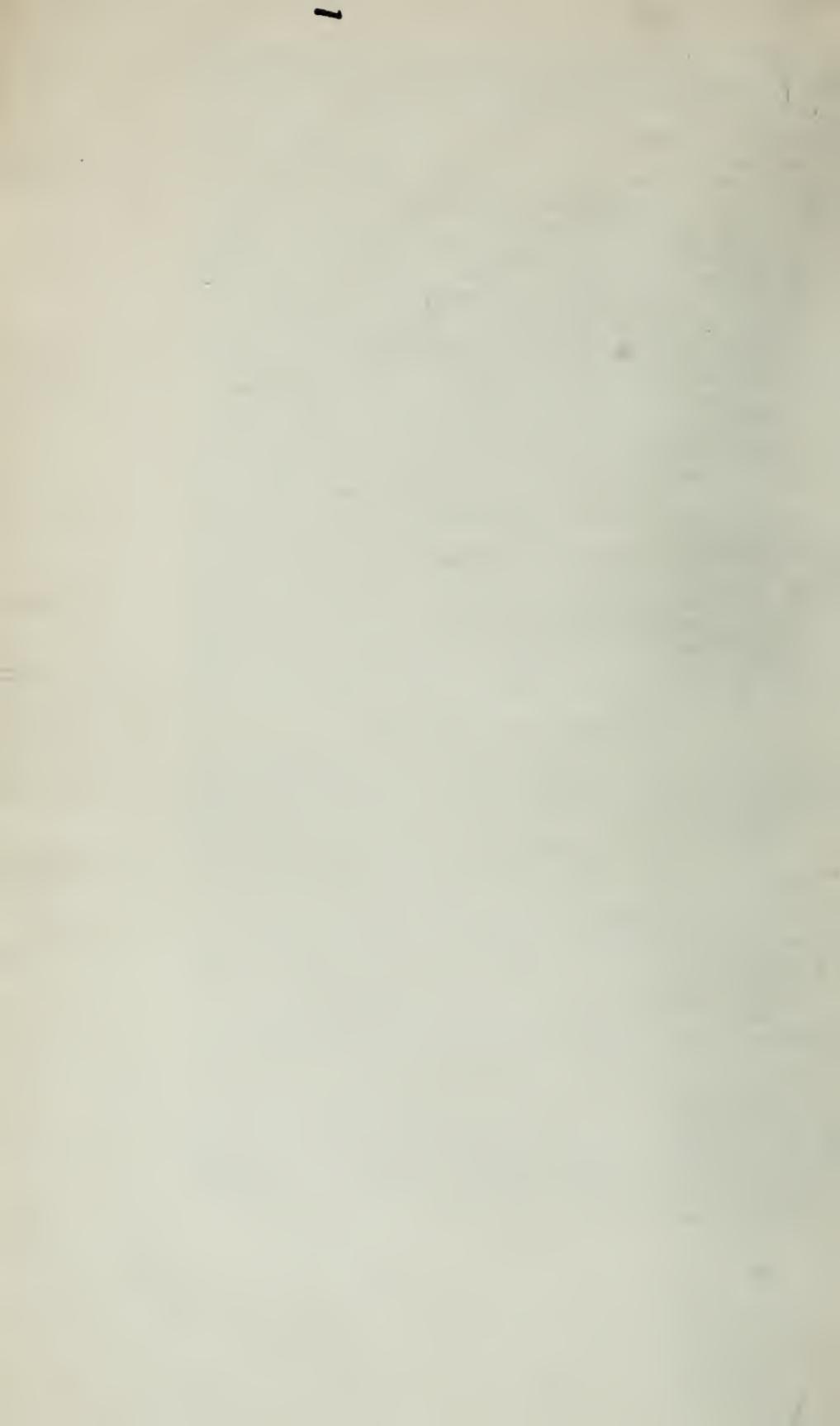
Announcement of the College of Pharmacy

Announcement of the Schools of Mines, Engineering and Chemistry

Announcement of the Schools of Fine Arts

For information upon any point not covered by the pamphlets, inquire of the Secretary of Columbia University.

Additional copies of this pamphlet may be obtained upon application. Instructors are requested to furnish the Secretary of the University, at as early a day as possible, with the names and addresses of students to whom the pamphlet should be sent.



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Eleventh Series, No. 5.

February 18, 1911.



Columbia University Bulletin of Information

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UNIVERSITY OF ILLINOIS

ENTRANCE EXAMINATIONS

AND

ADMISSION

1911-12

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(Issued 25 times during the Academic Year, monthly in November and December, and weekly between February and June. Entered as second-class matter at the New York, N. Y., Post Office, Dec. 22, 1900, under Act of July 16, 1894.)

These include :

1. The Reports of the President and the Treasurer to the Trustees.
2. The Catalogue of the University, issued in December, price 25 cents.
3. The Announcements of the several Colleges, Schools, and Divisions, issued in the Spring, and relating to the work of the next year. These are made as accurate as possible, but the right is reserved to make changes in detail as circumstances require. The current number of any of these Announcements will be sent without charge upon application to the Secretary of the University.

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ADMISSION TO COLUMBIA UNIVERSITY

A student may enter Columbia University as either (1) a matriculated student, accepted by the University as having fulfilled the preliminary qualifications for candidacy for a degree, a certificate in architecture, music, or design, or a diploma in teaching; or (2) a non-matriculated student, permitted to attend such courses as he may be qualified to take, but not regarded as a candidate for a degree, a certificate in architecture, music, or design, or a diploma in teaching.

The requirements for admission by examination to Columbia College, Barnard College, the Schools of Mines, Engineering, and Chemistry, the Schools of Fine Arts (courses leading to certificates), and the College of Pharmacy (University Course), are stated on pages 16-23.

There are no examinations for admission to the Schools of Law, to the College of Physicians and Surgeons, Political Science, Philosophy, Pure Science, and Fine Arts (courses leading to degrees), or to Teachers College. In general the requirements for admission to these departments are as follows:

Schools of Law, Political Science, Philosophy, and Pure Science, and Teachers College (Graduate curricula)—the completion of the full course in some recognized college or scientific school, or its equivalent;

The College of Physicians and Surgeons—the completion of two years of study in some recognized college or scientific school;

Teachers College (Professional curriculum)—the completion of two years of study in some recognized college or scientific school;

School of Architecture (course leading to degree of Bachelor of Architecture)—the completion of two years of study in some recognized college or scientific school, and a practical knowledge of the orders of architecture, and of freehand drawing, and ability to execute flat and graded washes of India ink in a satisfactory manner;

School of Music (course leading to degree of Bachelor of Music)—the completion of two years of study in some recognized college and the ability to play, on the pianoforte, the Two-Part Inventions of Bach.

For a more detailed statement of the requirements for admission to these departments, see the separate announcements of the Schools and Faculties concerned.

ADMISSION OF MATRICULATED STUDENTS

Candidates are enrolled as matriculated students upon presenting evidence of having fulfilled the stated requirements of admission to candidacy for a degree, a certificate of proficiency, or a diploma in teaching in Columbia University. Such evidence may consist in:

1. (a) A certificate of graduation from an acceptable college or scientific or professional school, or a foreign institution of equivalent grade, or
(b) Certification of the satisfactory completion of certain specified courses at some such institution, accompanied by evidence of honorable dismissal therefrom. Such certificate may, under appropriate conditions be that of the Summer Session or of the Department of Extension Teaching of Columbia University, or other institutions maintaining courses of equivalent grade.

The entrance credits of candidates who have completed at least one full year of collegiate or technical work, whether based upon examination or certification, are accepted by Columbia University in so far as they correspond to its requirements.

2. Certificates from the College Entrance Examination Board and the Committee on Undergraduate Admissions of Columbia University; or the credentials furnished by the Education Department of the State of New York showing that the candidate has completed certain courses (see p. 48) in a high school in the State of New York and that he has passed the examination of the Education Department in these subjects; and certificates of entrance examinations taken in good faith for admission to other institutions. *Such certificates are accepted only in so far as they cover specifically, and by name, subjects or lettered (or numbered) parts of a subject which are accepted for admission to the several schools as stated on pp. 25-47.* Except for reasons of weight such certificates are not accepted as covering subjects passed more than twenty-nine months previous to the date at which the candidate intends to begin residence. No certificates from preparatory schools nor from preparatory departments of colleges will be accepted in lieu of entrance examinations. For detailed information as to admission by examination see pages **II et seq.**

For credentials of the Education Department of the State of New York see page 8.

3. Certification of the appropriate faculty of Columbia University, or the duly authorized representative of such faculty, that a candidate, although unable to present the formal credits as prescribed under 1 and 2, has given evidence of an intellectual training and equipment equal to that evidenced by the completion of the formal entrance requirements. Such certification is made only for reasons of great weight and ordinarily only in the case of students who have completed satisfactorily at least a year of residence in the University as non-matriculated students.

ADMISSION AS NON-MATRICULATED STUDENTS

Non-matriculated students are admitted under conditions specified in the announcements of the several departments. They may not be regarded as candidates for a degree, certificate, or diploma in teaching, but they may receive a formal statement as to their records.

REGISTRATION

Before attending any University exercises each student must register, *i. e.*, must present himself in person to furnish the information necessary for the University records and to file statements of the courses he is authorized to pursue. Details will be found in the Bulletin of the faculty under which the student purposes to register.

Candidates for the Higher Degrees may register at any time during the academic year, subject to the regulations in regard to late registration.

Candidates for the degree of Bachelor of Arts or Bachelor of Science either at the beginning of the first or the second half-year. Candidates for the degrees in Mines, Engineering, and Chemistry may register at the beginning of the second half-year, provided they have satisfied the requirement stated on page 20. Candidates for the professional degrees, certificates, or diplomas in teaching are, in general, permitted to register only at the beginning of the academic year.

The attention of students is called to the fact that it is now possible to register either as a matriculated or a non-matriculated student under any faculty of the University during the Summer Session as well as during the academic year. For 1911 the registration dates are June 30, and July 1 and 3.

INQUIRIES

Inquiries for more detailed information than is contained herein may be made in person, or by mail or telephone, of the Secretary of the University, Room 213, Library Building, Columbia University, New York, N. Y. (telephone 1400 Morningside).

The Secretary will furnish upon request printed forms of application for entrance examinations, or blanks for admission to advanced standing, or as a non-matriculated student. He will obtain from the appropriate officers authoritative replies to specific inquiries as to the conditions governing the acceptance of any given certificate. A personal conference between a candidate and the appropriate faculty representative may be also arranged for through him.

PRESENTATION OF CREDENTIALS

The examination records of candidates taking the entrance examinations of Columbia University, and of those taking the examinations of the College Entrance Examination Board, who have announced on the application blank their intention of entering Columbia University, are recorded automatically in the office of the Registrar of the University, and referred by him to the appropriate admissions committee. All other credentials must be placed by the candidate in the hands of the Committee on Undergraduate Admissions in ample time for consideration by the Committee, and report to the candidate before registration. If sent by mail they should be addressed to the Secretary of the University, and accompanied by a letter stating (a) the specific college or school of the University the candidate desires to

enter, and (b) the address to which the reply should be sent. Applications for admission as non-matriculated students should be similarly treated.

Whenever a candidate has attended a secondary school for one year or longer before presenting himself for examination, a properly certified copy of the record of his performance shall be filed with the chairman of the Committee on Undergraduate Admissions in a form prescribed by the Committee. The Committee will give weight, in estimating the results of the candidate's entrance examination, to the record of his school performance.

In the case of candidates for admission to advanced standing, or for admission as non-matriculated students, time should be allowed to make arrangements for the candidate to present himself, if necessary, for such formal examination as may be prescribed by the Committee on Admissions. These examinations begin ordinarily at least ten days before the opening of the half-year. In 1911-12 application for such admission should be made before September 11, 1911, and January 8, 1912.

ADMISSION WITH CONDITIONS

Candidates who have not entirely completed the stated requirement for admission, but who in the judgment of the Committee on Admissions are regarded as qualified to pursue to advantage the work for which they desire to register, may be admitted conditionally. Except for reasons of weight a student who has failed to complete a course in a good high school or preparatory school will not be admitted with conditions. No further general information as to the terms under which students are admitted conditionally can be given, as each case is considered individually upon its merits. The attention of candidates is called to the special regulations as to admission with conditions stated in the Announcements of Barnard College, and the Schools of Mines, Engineering, and Chemistry.

CREDENTIALS OF THE EDUCATION DEPARTMENT OF THE STATE OF NEW YORK

The attention of high school students who intend to offer credentials of the Education Department of the State of New York for admission to Columbia College, Barnard College, the College of Pharmacy (University Course), the Schools of Mines, Engineering, and Chemistry, or the Schools of Fine Arts (courses leading to certificates) is called to the following general statement:

These credentials are accepted in so far as they cover specifically, and by name, subjects or lettered (or numbered) parts of a subject which are accepted for admission to the several schools as stated on pp. 25-47, and state in percentages the grades received in the examinations in such subjects.

The three-count electives in History are not accepted.

To secure credit for Drawing, both Drawing, three counts, and Advanced Drawing, three counts, must be offered; and in addition a *set*

of at least twenty freehand drawings duly certified by the teacher must be presented with the diploma.

In Physics, Chemistry, Physiography, Advanced Botany, and Advanced Zoölogy, a note-book duly certified by the teacher must be presented with the diploma. For table of equivalents see p. 48.

ENTRANCE EXAMINATIONS

Committee on Undergraduate Admissions

Professor JONES, *Chairman.*
Professor J. L. R. MORGAN
Professor BREWSTER
Professor COLE
Professor MACGREGOR
Professor McCREA

Professor VAN HOOK

Professor MAYER
Professor ODELL
Professor RAUTENSTRAUCH
Professor RUSBY
Professor SACHS
Professor SHERMAN

GENERAL STATEMENT

Examinations for admission to Columbia College, Barnard College, the Schools of Mines, Engineering, and Chemistry, the Schools of Fine Arts (courses leading to certificates), and the College of Pharmacy (University Course) are held each year in January, June, and September. In 1911 they will be held June 19-24, and September 18-25, and in 1912 January 15-22.

In June the examinations are those of the College Entrance Examination Board, of which Columbia University is a member. The University accepts the numerical ratings of the Board, but fixes a uniform passing mark for the several colleges and schools.

In January and September the examinations will be held only at the University. The Board *at present* holds examinations only in June.

All persons taking the January examinations will receive due credit for the results of the examinations. Students may be admitted at the beginning of the second half-year, to Columbia College and Barnard College, and, provided they offer Plane Analytical Geometry, College Algebra, and Advanced Physics in addition to the stated requirements for admission, they may enter the Schools of Mines, Engineering, and Chemistry.¹ Students may not be admitted to the other schools of the University in February.

All correspondence with the College Entrance Examination Board, all requests for its publications, etc., should be addressed to its Secretary, Post-Office Sub-Station 84, New York, N. Y.

All correspondence with the University should be addressed to the Secretary of the University.

APPLICATION FOR EXAMINATION

Every candidate for examination is required to file an application.

¹ Students admitted to the Schools of Mines, Engineering, and Chemistry in February must take Physics 3 (Elementary Mechanics and Heat) and Drafting 1 and 3 (Engineering Drafting and Descriptive Geometry) in the Summer Session in order to take up the work of the second year.

For the examinations in June, 1911, the application must be filed with the Secretary of the College Entrance Examination Board. Applications for examination in the United States east of the Mississippi River (also at Minneapolis, St. Louis, and other points on the Mississippi River) must be filed on or before June 5. Applications for examination elsewhere in the United States or in Canada must be filed on or before May 29. Applications for examination outside of the United States and Canada must be filed on or before May 16. Requests for blank forms of application should be addressed to the Secretary of the Board.

For the examinations in September, 1911, and January, 1912, applications must be filed with the Registrar of Columbia University on or before September 11, and January 8. Requests for blank forms of application should be addressed to the Secretary of Columbia University and the Registrar of Barnard College.

EXAMINATION FEE

Every application for examination in June must be accompanied by a fee of \$5 for all candidates examined at points in the United States and Canada, and \$15 for all candidates examined at points outside of the United States and Canada.

Every application for examination in January or September must be accompanied either by a fee of \$5, by a receipt from the Bursar for an examination fee previously paid, or by the receipt issued by the Secretary of the College Entrance Examination Board for the June examinations immediately preceding. *The latter will be accepted in either September or January, but not in both; and a single fee paid to the University will cover only two consecutive series of examinations, namely, January and September or September and January.*

If a late application is accepted either by the College Entrance Examination Board, or by the University, a second fee of \$5 must be paid.

The examination fee receipt should be carefully preserved. It must be presented by the candidate to the Supervisor in charge of the examinations which he attends as evidence that he is entitled to be admitted to the same. No candidate will be admitted to the January or September examinations upon the receipt of the Board, unless that receipt bears the certification of the Registrar of Columbia University that the candidate's application has been filed.

DIVISION OF EXAMINATION

A candidate may present himself at any of the scheduled series of examinations subject to the following restrictions:

- (i) He may not present himself at more than four series of examinations except by special consent of the Committee on Undergraduate Admissions.

(2) The results of an examination shall stand to his credit for twenty-nine months, but no longer.

NOTE. The September examinations are intended for candidates who plan to enter college immediately. Preliminary examinations should not be taken at this time.

PLACES OF EXAMINATION

In June, 1911, entrance examinations will be held at a large number of widely distributed points, a list of which will be published by the College Entrance Examination Board about March 1. Requests for examinations at particular points should reach the Secretary of the Board not later than February 1.

In September, 1911, and January, 1912, examinations will be held only at the University.

EXAMINATION SUBJECTS

Columbia University recognizes the following examination subjects, which may be offered for admission to one or more of the colleges and schools included in the University, each subject counting for a specific number of units as indicated below:

English.....	3	Harmony.....	I
Elementary French.....	2	Musical Appreciation.....	I
" German.....	2	Musical Performance ¹	2
" Greek.....	3	Physiography.....	I
" History.....	2	Shopwork ¹	I
" Italian ¹	2	Zoölogy.....	I
" Latin.....	4	Intermediate French.....	I
" Mathematics.....	2½	" German.....	I
" Physics.....	1	Advanced English ¹	I
" Spanish.....	2	" Greek ¹	I
Botany.....	I	" History ¹	I
Chemistry.....	I	" Latin ¹	I
Drawing.....	I	" Mathematics.....	½-I½

For a statement as to the combinations of subjects which may be offered by candidates for admission to the several colleges and schools see pages 16-23.

SCHEDULE OF EXAMINATIONS

The examinations at Columbia University will be held as follows:

For men, in Earl Hall in January, and in the Gymnasium in June and September.

For women, in Barnard College in January, June, and September.

Candidates taking these examinations must report to the Supervisor in the examination room, fifteen minutes in advance of the first examination which they are to attend.

¹ Candidates will be examined in this subject only in January and September.

Schedule of Examinations

June 19-24, 1911

Monday, June 19

Mathematics <i>a</i> (elementary algebra, complete)	.	.	.	9.30-12.30
Mathematics <i>a</i> , <i>i</i> (algebra to quadratics)	.	.	.	9.30-11.30
Mathematics <i>a</i> , <i>ii</i> (quadratics and beyond)	.	.	.	9.30-11.30
History <i>b</i> (mediaeval and modern history)	.	.	.	1.30-3.30
History <i>d</i> (American History)	.	.	.	1.30-3.30
Physics	.	.	.	3.45-5.45
Botany	.	.	.	3.45-5.45
Zoölogy	.	.	.	3.45-5.45

Tuesday, June 20

Mathematics <i>c</i> (plane geometry)	.	.	.	9-II
Mathematics <i>d</i> (solid geometry)	.	.	.	9-II
Mathematics <i>cd</i> (plane and solid geometry)	.	.	.	9-II
History <i>a</i> (ancient history)	.	.	.	1.30-3.30
History <i>c</i> (English history)	.	.	.	1.30-3.30
German <i>a</i> (elementary)	.	.	.	3.45-5.45

Wednesday, June 21

Latin <i>N R 3</i> (second year Latin)	.	.	.	9-10.30
Latin <i>b</i> (Cesar)	.	.	.	9-10.30
Latin <i>N R 1</i> (grammar)	.	.	.	10.45-12.30
Latin <i>m</i> (elementary sight translation of prose)	.	.	.	10.45-12.30
French <i>a</i> (elementary)	.	.	.	1.30-3.30
German <i>b</i> (intermediate)	.	.	.	3.45-5.45
Spanish	.	.	.	3.45-5.45

Thursday, June 22

Latin <i>N R 4</i> (Cicero— <i>Manilian Law</i> and <i>Archias</i> , and sight translation of prose)	.	.	.	9-II
Latin <i>c</i> (Cicero)	.	.	.	9-II
Latin <i>p</i> (advanced sight translation of prose)	.	.	.	9-II
Latin <i>N R 2</i> (elementary prose composition)	.	.	.	11.15-12.30
Latin <i>a</i> , <i>i</i> (grammar)	.	.	.	11.15-11.50
Latin <i>a</i> , <i>ii</i> (elementary prose composition)	.	.	.	11.50-12.30
Latin <i>N R 5</i> (Virgil— <i>Æneid</i> I, II, and IV or VI, and sight translation of poetry)	.	.	.	1.30-3.30
Latin <i>d</i> (Virgil)	.	.	.	1.30-2.30
Latin <i>q</i> (sight translation of poetry)	.	.	.	1.30-3.30
Latin <i>dq</i> (Virgil and sight translation)	.	.	.	1.30-3.30
French <i>b</i> (intermediate)	.	.	.	3.45-5.45

Friday, June 23

English <i>a</i> (reading and practice)	.	.	.	9-II
Latin <i>N R 6</i> (advanced prose composition)	.	.	.	11.15-12.30
Latin <i>l</i> (prose composition)	.	.	.	11.15-12.30
English <i>b</i> (study and practice)	.	.	.	1.30-3.30
Chemistry	.	.	.	3.45-5.45
Geography	.	.	.	3.45-5.45
Greek <i>c</i> (Homer's Iliad, Books I-III)	.	.	.	3.45-5.45
Greek <i>h</i> (sight translation of Homer)	.	.	.	3.45-5.45
Greek <i>ch</i> (Homer's Iliad, Books I-III, and sight translation of Homer)	.	.	.	3.45-5.45
Music <i>b</i> (harmony)	.	.	.	3.45-5.45

Schedule of Examinations

Saturday, June 24

Greek <i>b</i> (Xenophon's <i>Anabasis</i>)	9-II
Drawing	9-II
Mathematics <i>b</i> (advanced algebra)	9-II
Greek <i>a</i> , <i>i</i> (grammar)	II.15-12
Greek <i>a</i> , <i>ii</i> (elementary prose composition)	12-12.30
Mathematics <i>f</i> (plane trigonometry)	1.30-3.30
Greek <i>g</i> (sight translation of prose)	1.30-3.30
Greek <i>f</i> (prose composition)	3.45-5.15
Music <i>a</i> (appreciation)	3.45-5.45

September 18-25, 1911, January 15-22, 1912

Monday, September 18 and January 15

Mathematics <i>a</i> (elementary algebra, complete)	9.30-12.30
Mathematics <i>a</i> , <i>i</i> (algebra to quadratics)	9.30-11.30
Mathematics <i>a</i> , <i>ii</i> (quadratics and beyond)	9.30-11.30
History <i>b</i> (mediæval and modern history)	1.30-3.30
History <i>d</i> (American history)	1.30-3.30
Physics	3.45-5.45
Botany	3.45-5.45
Zoölogy	3.45-5.45

Tuesday, September 19 and January 16

Mathematics <i>c</i> (plane geometry)	9-II
Mathematics <i>d</i> (solid geometry)	9-II
Mathematics <i>cd</i> (plane and solid geometry)	9-12
History <i>a</i> (ancient history)	1.30-3.30
History <i>c</i> (English history)	1.30-3.30
German <i>a</i> (elementary)	3.45-5.45

Wednesday, September 20 and January 17

<i>N R 1</i> , <i>N R 2</i> , (grammar, and elementary prose composition)	9-12.30
Latin <i>N R 3</i> (second year Latin)	9-II
Latin <i>b</i> (Cæsar)	9-II
Latin <i>m</i> (elementary sight translation of prose)	II.15-12.30
French <i>a</i> (elementary)	1.30-3.30
German <i>b</i> (intermediate)	3.45-5.45
Spanish	3.45-5.45
Italian	3.45-5.45

Thursday, September 21 and January 18

Latin <i>N R 4</i> (Cicero— <i>Manilian Law</i> and <i>Archias</i> , and sight translation of prose)	9-II
Latin <i>c</i> (Cicero)	9-II
Latin <i>a</i> , (grammar and elementary prose composition)	II.15-12.30
Shopwork (written)	1.30-3.00
Latin <i>N R 5</i> (Vergil— <i>Aeneid</i> I, II, and IV or VI, and sight translation of poetry)	1.30-3.30
Latin <i>d</i> (Vergil)	1.30-3.30
French <i>b</i> (intermediate)	3.45-5.45

Schedule of Examinations

Friday, September 22 and January 19

English <i>a</i> (reading and practice)	9-II
Latin <i>N R 6</i> (advanced prose composition)	II. 15-12.30
Latin <i>l</i> (prose composition)	II. 15-12.30
English <i>b</i> (study and practice)	1.30-3.30
Chemistry	3.45-5.45
Physiography	3.45-5.45
Greek <i>c</i> (Homer's Iliad, Books I-III)	3.45-5.45
Music <i>b</i> (harmony)	3.45-5.45

Saturday, September 23 and January 20

Greek <i>b</i> (Xenophon's Anabasis)	9-II
Drawing	9-II
Mathematics <i>b</i> (advanced algebra)	9-II
Greek <i>a</i> , (grammar and elementary prose composition)	II-12.30
Mathematics <i>f</i> (plane trigonometry)	1.30-3.30
Greek <i>g</i> (sight translation of prose)	1.30-3.30
Greek <i>f</i> (prose composition)	3.45-5.15
Music <i>a</i> (appreciation)	3.45-5.45

Monday, September 25 and January 22

Advanced English	9-II
Advanced Greek	9-II
Shopwork (laboratory)	10-II
Advanced Latin	I-4
Advanced History	I-4

TO ENTER COLUMBIA COLLEGE

Total requirement.....14 $\frac{1}{2}$ units

Candidates for the A.B. degree must offer:

English (page 27).....	counting	3	units
Elementary Mathematics (page 40).....	"	2 $\frac{1}{2}$	"
Elementary Latin (see note, page 37).....	"	4	"
Elective Subjects.....	"	5	"

Candidates for the B.S. degree must offer:

English (page 27).....	"	3	"
Elementary Mathematics (page 40).....	"	2 $\frac{1}{2}$	"
either Elementary Latin.....	"	4	"
or Chemistry (page 26).....	"	1	unit
or Physics (page 43).....	"	1	"
or Intermediate or advanced subjects from Group I.....	"	2	units
Elective subjects.....	"	5	"

Elective Subjects

Group I.

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering,

Elective Subjects

either at the same time or earlier, the corresponding elementary subject:

Elementary Greek (page 34).....	counting	3	units
Elementary History (see note, page 35)	"	2	"
or " " 1 unit			
Drawing (page 26).....	"	1	"
Music (page 41).....	"	1	"
Intermediate French (page 31).....	"	1	"
Intermediate German (page 32).....	"	1	"
Advanced English (page 27).....	"	1	"
Advanced Greek (page 34).....	"	1	"
Advanced History (page 35).....	"	1	"
Advanced Latin (page 37).....	"	1	"
Advanced Mathematics (page 40)....	"	$\frac{1}{2}$, 1, unit	
or " " 1 $\frac{1}{2}$ units			

and in the case of candidates for B.S. degree:

Elementary Latin (see note, page 37)	"	4	"
or " " 2			

Group II.

The candidate may offer not more than 4 units in all from the four subjects following:

Elementary French (page 31).....	counting	2	units
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Elementary German (page 32).....	counting	2	units
Italian (page 36).....	"	2	"
Spanish (page 45).....	"	2	"

Group III.

The candidate may offer not more than 3 units in all from the six subjects following:

Botany (page 25).....	counting	1	unit
Chemistry (page 26).....	"	1	"
Physics (page 43).....	"	1	"
Physiography (page 44).....	"	1	"
Shopwork (page 44).....	"	1	"
Zoölogy (page 46).....	"	1	"

TO ENTER BARNARD COLLEGE

Total requirement.....14½ units

Prescribed Subjects

Candidates for the A.B. degree must offer:

English (page 27).....	counting	3	units
Elementary Mathematics (page 40).....	"	2½	"
Elementary Latin (see note, page 37)	"	4	"
Elective subjects (pages 18-19).....	"	5	"

Candidates for the B.S. degree must offer:

English (page 27).....	"	3	"
Elementary Mathematics (page 40).....	"	2½	"
Science (from Group III).....	"	2	"
Intermediate or advanced subjects (from Group I)	"	2	"
Elective subjects.....	"	5	"

Candidates for the general two-years' course
must offer:

English (page 27).....	"	3	"
Elementary Mathematics (page 40).....	"	2½	"
Ancient or Modern Foreign Languages...	"	4	"
History, Foreign Languages, Mathematics, or Science	"	5	"

Elective Subjects

Group I.

The candidate may offer any of the following subjects without other restriction than that to offer an advanced subject will involve offering either at the same time or earlier, the corresponding elementary subject:

Elementary Greek (page 34)	counting	3	units
Elementary History (see note, page 35)	"	2	"
or	"	1	unit
Drawing (page 26).....	"	1	"
Music (page 41)	"	1	"
Intermediate French (page 31).....	"	1	"
Intermediate German (page 32).....	"	1	"
Advanced English (page 29).....	"	1	"
Advanced Greek (page 34).....	"	1	"
Advanced History (page 35).....	"	1	"
Advanced Latin (page 37).....	"	1	"
Advanced Mathematics (page 40).....	"	½, 1	unit
or	"	1½	units

and in the case of candidates for B.S. degree:

Elementary Latin (see note, page 37)....	"	2	units
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Group II.

The candidate may offer not more than 4 units in all from the four subjects following:

Elementary French (page 31)	counting	2	units
Elementary German (page 32)	"	2	"
Italian (page 36)	"	2	"
Spanish (page 45)	"	2	"

Group III.

The candidate may offer not more than 2 units in all from the five subjects following, except candidates for B.S. degree, who must offer 2 units and may offer more without restriction:

Botany (page 25)	counting	1	unit
Chemistry (page 26)	"	1	"
Physics (page 43)	"	1	"
Physiography (page 44)	"	1	"
Zoölogy (page 46)	"	1	"

TO ENTER THE SCHOOLS OF MINES, ENGINEERING, AND CHEMISTRY

Total requirement..... 14½ units

The candidate *must* offer :

Chemistry (page 26).....	counting 1 unit
Drawing (page 26).....	" 1 "
Elementary French (page 31)	}
<i>or</i>	
Elementary German (page 32)	2 units
English (page 27).....	" 3 "
Mathematics (page 40).....	" 3½ "
Physics (page 43).....	" 1 unit
Elective subjects.....	3 units

The candidate may offer any of the following, subject to the restriction that to offer an advanced subject will involve offering, either at the same time or earlier, the corresponding elementary subject :

Elective Subjects

Elementary French	}	...counting 2 units
<i>or</i>		
Elementary German (see above)		
American History (see note, page 35).	"	1 unit
Ancient History (see note, page 35)...	"	1 "
English History (see note, page 35)...	"	1 "
Mediæval and Modern History (see		
note, page 35)	"	1 "
Elementary Latin (see note, page 37).	"	2 units
Botany (page 25).....	"	1 unit
Physiography (page 44).....	"	1 "
Shopwork (page 44).....	"	1 "
Spanish (page 45).....	"	2 units
Zoölogy (page 46).....	"	1 unit
Intermediate French (page 31).....	"	1 "
Intermediate German (page 32).....	"	1 "

All candidates for degrees of Engineer of Mines, Metallurgical and Chemical Engineer, or Chemist, are recommended to offer Elementary and Intermediate German.

Except for reasons of weight no student will be admitted with a condition in Mathematics, Chemistry, or Physics. It is suggested that candidates deficient in these subjects in June arrange to take courses in them in the Summer Session of Columbia University, the announcement of which will be sent upon application to the Secretary of the University.

Attention is called to the fact that the requirements for the Bachelor's

degree and for a degree from one of the Schools of Mines, Engineering, and Chemistry may both be fulfilled in six years. Candidates wishing to fulfil in this way the requirements for both degrees should first enter Columbia College.

TO ENTER THE COLLEGE OF PHARMACY

(University Course—leading to the degree of Pharmaceutical Chemist

Total requirement..... $11\frac{1}{2}$ units

The candidate *must* offer $11\frac{1}{2}$ units from the subjects following, subject to the restriction that to offer an advanced subject will involve offering, either at the same time or earlier, the corresponding elementary subject:

English (page 27).....	counting	3	units
Elementary French (page 31).....	"	2	"
Elementary German (page 32).....	"	2	"
Elementary Greek (page 34).....	"	3	"
Elementary History (see note, page 35).....	"	2	"
	or	"	1 unit
Elementary Latin (see note, page 37)....	"	4	units
	or	"	2 "
Elementary Mathematics (page 40).....	"	$2\frac{1}{2}$	"
Elementary Physics (page 43).....	"	1	unit
Intermediate French (page 31).....	"	1	"
Intermediate German (page 32).....	"	1	"
Advanced Greek (page 34).....	"	1	"
Advanced History (page 35).....	"	1	"
Advanced Latin (page 39)	"	1	"
Advanced Mathematics (page 40).....	"	1	"
Botany (page 25).....	"	1	"
Chemistry (page 26).....	"	1	"
Drawing (page 26).....	"	1	"
Physiography (page 44).....	"	1	"
Spanish (page 45).....	"	2	units
Zoölogy (page 46).....	"	1	unit

TO ENTER THE SCHOOLS OF FINE ARTS

SCHOOL OF ARCHITECTURE

Total requirement..... $11\frac{1}{2}$ units

The candidate *must* offer :

English (page 27).....	counting	3	units
Elementary Mathematics (page 40).....	"	$2\frac{1}{2}$	"
Drawing (page 26).....	"	1	unit
Elective subjects.....	"	5	units

The candidate may offer any of the subjects following, subject to the restriction that in foreign languages not more than 4 units may be offered, and that, if four be offered, one of the languages must be French :

Elective Subjects

Elementary French (page 31).....	counting	2	units
Elementary German (page 32).....	"	2	"
Elementary History (page 35).....	"	2	"
	or	"	1 unit
Elementary Latin (see note, page 37)....	"	2	units
Elementary Physics (page 43).....	"	1	unit
Chemistry (page 26).....	"	1	"
Spanish (page 41).....	"	2	units
Advanced Mathematics (page 40).....	"	1	unit

Candidates are strongly recommended to include Elementary French and Advanced Mathematics among the subjects offered.

They will also be required to give evidence by examination, certificate, or duly certified work, of a practical knowledge of the orders of architecture, of brushwork in India-ink and color, and of freehand pencil drawing.

SCHOOL OF MUSIC

Total requirement..... $9\frac{1}{2}$ units

The candidate *must* offer :

English (page 27).....	counting	3	units
One other language.....	"	2 or 3	units
Elective subjects.....	"	$4\frac{1}{2}$ or $3\frac{1}{2}$	units

and may offer any of the following, subject to the restriction that to offer an advanced subject will involve offering, either at the same time or earlier, the corresponding elementary subject :

Elective Subjects

Elementary French (page 31).....	counting	2	units
Elementary German (page 32).....	"	2	"
Elementary Greek (page 32).....	"	3	"
Elementary History (page 35).....	"	2	"
	or	"	1 unit
Elementary Latin (see note, page 37)....	"	2	units
Elementary Mathematics (page 40)...	"	$2\frac{1}{2}$	"

Elementary Physics (page 43)	counting	1	unit
Italian (page 36)	"	2	units
Harmony (page 41)	"	1	unit
Musical Appreciation (page 41)	"	1	"
Musical Performance (page 42)	"	2	units
Advanced History (page 35)	"	1	unit
Advanced Mathematics (page 40)	"	1	"

Candidates will also be required to give evidence of their ability to play, on the pianoforte, the Two-Part Inventions of Bach.

Candidates for a *degree* in Music must offer for admission two years of College work.

SCHOOL OF DESIGN

Total requirement.....9½ units

The candidate *must* offer :

Drawing (page 26)	counting	1	unit
English (page 27)	"	3	units

and either Elementary French (page 31)...

or Elementary German (page 32)	"	2	"
or Italian (page 36)	"	3½	"

Elective subjects....." 3½ "

The candidate may offer any of the following, subject to the restriction that to offer an advanced subject will involve offering, either at the same time or earlier, the corresponding elementary subject :

Elective Subjects

either Elementary Greek (page 34).....counting 3 units

or Elementary Latin (see note, page 37)" 2 "

Elementary History (page 35)" 2 "

or " 1 unit

Elementary Mathematics (page 40)" 2½ units

Elementary Physics (page 43)" 1 unit

Chemistry (page 26)" 1 "

Advanced Mathematics (page 40)" 1 "

Candidates will also be required to give evidence of a practical knowledge of the elementary technique of work in India-ink and water-colors, and of proficiency in sketching from the object and from simple plaster casts of ornament or of the figure, in pencil or charcoal. The certification of the National Academy of Design as to proficiency in drawing is accepted in both the formal and the informal requirements in that subject.

SUBMISSION OF NOTE-BOOKS, DRAWINGS, ETC.

Each candidate must present at the time of the examination his laboratory note book, properly indexed. This book must bear the certification of the teacher in the following form :

Teacher's Certificate

..... School
..... 19....

I certify that has personally performed, as recorded by him in this note-book, experiments in the laboratory of the School, during the year

..... The laboratory course has occupied time equal to hours of 60 minutes each.

Signed
Teacher of

The teacher may here record the final grade on this laboratory work of per cent.

Drawings should bear a similar certification or in case of work not done under instruction should be accompanied by the candidate's own signed declaration.

All note-books, unless otherwise specified, should be submitted at the time of examination. Candidates desiring their return should apply, for the June examinations to the Secretary of the College Entrance Examination Board; for the September and January examinations to the Secretary of the University.

English exercise books, submitted in lieu of examination, Advanced English essays or Advanced History note-books should be sent to the Secretary of the University *at least two weeks before* the examinations begin. Within ten days the candidate will be informed whether or not the work submitted has been accepted. English exercise books will *not* be returned to the writers.

All note-books uncalled for one year from the date of submission will be destroyed.

DEFINITIONS OF REQUIREMENTS¹

(Specimens of the question papers set by Columbia University may be obtained from the chairman of the Committee on Undergraduate Admissions upon application. The question papers set by the College Entrance Examination Board are published annually in book form by Ginn and Company, Boston, Mass.

For a more detailed statement of the requirements in Botany and Physiography the reader is referred to the pamphlet containing definitions of the requirements in each subject, which is published by the College Entrance Examination Board. This pamphlet also contains lists of suitable laboratory experiments in Chemistry and Physics.)

BOTANY (counting one unit)

The candidate should have received training by means of the laboratory method in:

The structure and the more obvious features of the life history of at least ten types among the higher seed plants chosen from the more representative families (e. g., Gramineæ, Liliaceæ, Salicaceæ, Ranunculaceæ, Rosaceæ, Leguminosæ, Cruciferæ, Solanaceæ, Labiatæ, Compositæ). In addition to these, the following types are recommended among the remaining lower groups of plants: pine, *Selaginella*; a fern, a moss (*Polytrichum* or *Funaria*); a leafy hepatic, *Marchantia*; a mildew (*Microsphæra*); an agaric, *Vaucheria*, *Spirogyra*; and a protophyte (preferably *Sphærella*).

Morphology of shoot, root, and seed. This work covers the growth, character, relation, and function of the more important tissues of the stem, leaf, bud, and root, together with a study of the more common variation of these organs. The work on the seed includes the structure and homologies of the principal types, nature of reserve food, the renewal of growth of the seed, and the development of the seedling.

Physiology. This work should cover the essential facts concerning irritability, photosynthesis, respiration, digestion, growth, and reproduction.

Ecology. The natural history of plants should receive considerable attention, and the behavior of plants toward environmental factors (especially light and moisture), dissemination, cross and close pollination, and the more important structural and physiological characteristics of plant formations (hydrophytes, halophytes, mesophytes, and xerophytes) should be included.

¹ The several subjects are stated in terms of units; the unit is a course of five periods weekly throughout an academic year of the preparatory school; the subjects are assigned units in accordance with the time required to prepare adequately upon them for college entrance

As evidence of proper laboratory training and of satisfactory work, a note-book must be submitted. (See Submission of Note-books, page 24.)

CHEMISTRY (counting one unit)

The candidate's preparation in Chemistry should include:

- a. The study of a standard text-book, to the end that the pupil may gain a comprehensive and connected view of the most important facts and laws of elementary chemistry.
- b. Instruction by lecture-table demonstrations, to be used mainly as a basis for questioning upon the general principles involved in the pupil's laboratory investigations.
- c. Individual laboratory work, comprising at least forty exercises.

An indexed note-book of the experiments must be submitted. (See Submission of Note-books, page 24.)

The following outline includes only the indispensable things which must be studied in the class-room and laboratory. The material is, for the most part, common to all elementary text-books and laboratory manuals. The order of presentation will naturally be determined by each teacher for himself.

OUTLINE.—The chief physical and chemical characteristics, the preparation and the recognition of the following elements together with their principal compounds: *oxygen, hydrogen, carbon, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, silicon, potassium, sodium, calcium, magnesium, zinc, copper, mercury, silver, aluminum, lead, tin, iron, manganese, chromium*.

More detailed study should be confined to the italicized *elements* (as such) and to a restricted list of compounds such as water, hydrochloric acid, carbon-monoxide, carbon-dioxide, oxides of nitrogen, nitric acid, ammonia, sulphur-dioxide, sulphuric acid, hydrogen sulphide, sodium-hydroxide, ammonium-hydroxide.

Attention should be given to the atmosphere (constitution and relation to animal and vegetable life), flames, acids, bases, salts, oxidation and reduction, crystallization, combining proportions by weight and volume, calculations founded on these and Boyle's and Charles's laws, symbols and nomenclature, atomic and ionization theory, atomic weights, valency (in a very elementary way), nascent state, natural grouping of the elements, solution (solvents and solubility of gases and solids and liquids, saturation), strength of acids and bases, conservation and dissipation of energy, chemical energy, electrolysis. Chemical terms should be clearly understood, and the pupil should be able to illustrate and apply the ideas they embody. The theoretical topics are not intended to form separate subjects of study, but to be taught only so far as is necessary for the correlation and explanation of the experimental facts.

DRAWING (counting one unit)

The candidate's preparation in Freehand Drawing should include

simple geometrical, plane, and solid figures, simple pieces of machinery, the drawing of simple pieces of architectural ornament (a Greek anthemion, a design of iron scrollwork, etc.), the copying of machinery details, or the copying of still life and simple plant forms, with a fair knowledge of perspective and light and shade as applied in freehand sketching. The candidate should be able to reproduce from a flat copy with enlargement or reduction of size.

Every candidate must present at the time of and as part of the examination in drawing a set of freehand drawings executed during one year's course in a preparatory school and within a period of two years before the time of application for admission.

These drawings should be at least twenty in number and should display the proficiency of the student in the following points:

1. Ability to sketch freehand from dictation, with reasonable accuracy and with fairly correct, steady, and clean lines, any simple geometrical figure or combinations of figures, straight lines, squares and circles, polygons, spirals, or the like.

2. Ability to sketch from the object, with reasonable correctness of proportion, structure, and form, geometrical models, simple vases, simple details of machinery or common objects such as ordinary household furniture and utensils.

3. Ability to sketch from the copy, enlarging or reducing its dimensions, any simple object such as a globe valve, stop-cock, or any ordinary historical ornament such as an acanthus leaf, egg and dart ornament, anthemion, tile pattern, iron scrollwork or the like.

Correctness of proportion and accuracy in the angles and curves and structural relations of the parts of every figure or object drawn are of the highest importance, and great care should be taken in laying out the drawings in the use of construction lines and in the drawing of general masses and contour before the details are begun.

A certain proportion of shade drawing from casts may be included, but they are not required and should not form the majority of the drawings submitted.

All drawings should be of uniform size, and fastened together, not rolled.

In case the candidate has not attended a systematic course of instruction as detailed above he may submit a corresponding set of freehand drawings. (See Submission of Note-books, page 24.)

ENGLISH

Elementary (counting three units)

No applicant will be accepted in English whose work is notably defective in point of spelling, grammar, idiom, punctuation, or division into paragraphs.

a. Reading and Practice.—The form of examination will usually be the writing of a paragraph or two on each of several topics, to be chosen by the candidate from a considerable number—per-

haps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to show the candidate's power of clear and accurate expression, and will call for only a general knowledge of the substance of the books. *In every case knowledge of the book will be regarded as less important than the ability to write good English.* In place of a part or the whole of this test, the candidate may present an exercise book, properly certified by his instructor, containing compositions or other written work done in connection with the reading of the books, and prepared in accordance with a list of directions to be obtained by addressing the Secretary of the University. (See Submission of Note-books, page 24.) In preparation for this part of the requirement, it is important that the candidate shall have been instructed in the fundamental principles of rhetoric. Candidates intending to take this part of the examination should read the books prescribed for the year in which they propose to submit themselves for examination in this subject.

In 1911 ten books, and in 1912 nine books, selected from the following list as prescribed below, are to be offered for examination:

Group I (two to be selected). Shakspere's *As You Like It*, *Henry V*, *Julius Cæsar*, *The Merchant of Venice*, *Twelfth Night*.

Group II (one to be selected). Bacon's *Essays*; Bunyan's *The Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers in the Spectator*; Franklin's *Autobiography*.

Group III (one to be selected). Chaucer's *Prologue*; Spenser's *Faerie Queene* (selections); Pope's *The Rape of the Lock*; Goldsmith's *The Deserted Village*; Palgrave's *Golden Treasury* (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns.

Group IV (two to be selected). Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; Dickens's *A Tale of Two Cities*; George Eliot's *Silas Marner*; Blackmore's *Lorna Doone*.

Group V (two, but in 1912 one, to be selected). Irving's *Sketch-Book*; Lamb's *Essays of Elia*; De Quincey's *Joan of Arc* and *The English Mail Coach*; Carlyle's *Heroes and Hero Worship*; Emerson's *Essays* (Selected); Ruskin's *Sesame and Lilies*.

Group VI (two to be selected). Coleridge's *The Ancient Mariner*; Scott's *The Lady of the Lake*; Byron's *Mazeppa* and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley; Macaulay's *Lays of Ancient Rome*; Poe's *Poems*; Lowell's *The Vision of Sir Launfal*; Arnold's *Sohrab and Rustum*; Longfellow's *The Courtship of Miles Standish*; Tennyson's *Gareth and Lynette*, *Launcelot and Elaine*, and *The Passing of Arthur*, but in 1912 Tennyson's *The Princess* is substituted; Browning's *Cavalier Tunes*, *The Lost Leader*,

How They Brought the Good News from Ghent to Aix, Evelyn Hope, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, The Boy and the Angel, One Word More, Hervé Riel, Pheidippides.

In 1913, 1914, and 1915, ten units are to be selected, two from each group :

Group I. The *Old Testament*, comprising at least the chief narrative episodes in *Genesis*, *Exodus*, *Joshua*, *Judges*, *Samuel*, *Kings*, and *Daniel*, together with the books of *Ruth* and *Esther*; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Vergil's *Aeneid*. The *Odyssey*, *Iliad*, and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II. Shakspere's *The Merchant of Venice*; *Midsummer Night's Dream*; *As You Like It*; *Twelfth Night*; *Henry the Fifth*; *Julius Caesar*.

Group III. Defoe's *Robinson Crusoe*, Part I; Goldsmith's *The Vicar of Wakefield*; either Scott's *Ivanhoe*, or Scott's *Quentin Durward*; Hawthorne's *The House of the Seven Gables*; either Dickens's *David Copperfield*, or Dickens's *A Tale of Two Cities*, Thackeray's *Henry Esmond*; Mrs. Gaskell's *Cranford*; George Eliot's *Silas Marner*; Stevenson's *Treasure Island*.

Group IV. Bunyan's *Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in the *Spectator*; Franklin's *Autobiography* (condensed); Irving's *Sketch Book*; Macaulay's *Essays on Lord Clive and Warren Hastings*; Thackeray's *English Humourists*; *Selections* from Lincoln, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and Letter to Horace Greeley, along with a brief memoir or estimate; Parkman's *Oregon Trail*; either Thoreau's *Walden*, or Huxley's *Autobiography* and *selections* from *Lay Sermons*, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; Stevenson's *Inland Voyage* and *Travels with a Donkey*.

Group V. Palgrave's *Golden Treasury* (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *The Deserted Village*; Coleridge's *The Ancient Mariner* and Lowell's *The Vision of Sir Launfal*; Scott's *The Lady of the Lake*; Byron's *Childe Harold*, Canto IV, and *The Prisoner of Chillon*; Palgrave's *Golden Treasury* (First Series) Book IV, with especial attention to Wordsworth, Keats, and Shelley; Poe's *The Raven*, Longfellow's *The Courtship of Miles Standish*, and Whittier's *Snow Bound*; Macaulay's *Lays of Ancient Rome* and

Arnold's *Sohrab and Rustum*; Tennyson's *Gareth and Lynette*, *Launcelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Hervé Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City*.

b. Study and Practice.—This part of the examination presupposes the thorough study of each of the works named below. The examination will be upon subject-matter, form, and structure. In addition, the candidate may be required to answer questions involving the essentials in English grammar, and questions on the leading facts in those periods of English literary history to which the prescribed works belong.

In connection with the reading and study of the required books, parallel or subsidiary reading should be encouraged, and a considerable amount of English poetry should be committed to memory. The essentials of English grammar should not be neglected in preparatory study.

The books prescribed for this part of the examination are as follows:

In 1911: Shakspere's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

In 1912: Shakspere's *Macbeth*; Milton's *Comus*, *L'Allegro*, and *Il Penseroso*, or Tennyson's *Gareth and Lynette*, *Launcelot and Elaine*, and *The Passing of Arthur*; Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

In 1913, 1914, and 1915: Shakspere's *Macbeth*; Milton's *L'Allegro*, *Il Penseroso*, and *Comus*; either Burke's *Speech on Conciliation with America*, or both Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*; either Macaulay's *Life of Johnson*, or Carlyle's *Essay on Burns*.

ADVANCED (counting one unit)

Candidates offering Advanced English will be required to have covered substantially the same ground as that included under English **A1-A2**, the course prescribed for freshmen. Candidates are examined in the following subjects:

1. English composition, with special attention to correctness of style and to orderly arrangement of material. In preparation for this part of the examination, the student should gain a practical acquaintance with the principles of rhetoric as expounded in any good text-book.

2. English literature—the general history from the Anglo-Saxon period to the death of Tennyson and selected works from the Elizabethan period to the present day. The selected works are: Marlowe's *Edward II*; Shakspere's *Hamlet*; Milton's *Paradise Lost* (Books I, II, III, and VI); Dryden's *Essay on Dramatic Poesy*; Swift's *The Battle of the Books*; Pope's *Iliad* (Books I, VI, XXII, and XXIV); Goldsmith's *She Stoops to Conquer*; Byron's *Childe Harold*; Webster's *Reply to Hayne*; Dickens's *Old Curiosity Shop*.

In examination the candidate will be expected to answer questions on the history of English literature and to write short essays based on topics relating to the works prescribed. In addition, he must submit not less than ten essays of at least 500 words each. At least half, but not all, of these essays should be on topics chosen from the books prescribed. (See Submission of Note-books, page 24.)

FRENCH

a. Elementary (counting two units)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course the pupil should be able to pronounce French accurately, to read at sight easy French prose, to put into French simple English sentences taken from the language of everyday life, or based upon a portion of the French text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural of nouns, the inflection of adjectives, participles, and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix the memory of the form and principles of grammar but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practice in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of easy modern prose in the form of stories, plays, or historical or biographical sketches; (2) constant practice, as in the previous year, in translating into French easy variations upon the texts read; (3) frequent abstracts, sometimes oral and sometimes written, of portions of the text already read; (4) writing French from dictation; (5) continued drill upon the rudiments of grammar, with constant application in the construction of sentences; (6) mastery of the forms and use of pronouns, pronominal adjectives, of all but the

rare irregular verb forms, and of the simpler uses of the conditional and subjunctive.

Suitable texts for the second year are: About's *Le roi des montagnes*, Bruno's *Le tour de la France*, Daudet's easier short tales, La Bédolière's *La Mère Michel et son chat*, Erckmann-Chatrian's stories, Foa's *Contes biographiques* and *Le petit Robinson de Paris*, Foncin's *Le Pays de France*, Labiche and Martin's *La poudre aux yeux* and *Le voyage de M. Perrichon*, Legouvé and Labiche's *La cigale chez les fourmis*, Malot's *Sans famille*, Mairet's *La tâche du petit Pierre*, Mérimée's *Colombo*, extracts from Michelet, Sarcey's *Le siège de Paris*, Verne's stories.

b. Intermediate (counting one unit)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight ordinary French prose or simple poetry, to translate into French a connected passage of English based on the text read, and to answer questions involving a more thorough knowledge of syntax than is expected in the elementary course.

THE WORK TO BE DONE.—This should comprise the reading of from 400 to 600 pages of French of ordinary difficulty, a portion to be in the dramatic form; constant practice in giving French paraphrases, abstracts, or reproductions from memory of selected portions of the matter read; the study of a grammar of moderate completeness; writing from dictation.

Suitable texts are: About's stories, Augier and Sandeau's *Le gendre de M. Poirier*, Béranger's poems, Corneille's *Le Cid* and *Horace*, Coppée's poems, Daudet's *La Belle-Nivernaise*, La Brète's *Mon oncle et mon curé*, Madame de Sévigné's letters, Hugo's *Hernani* and *La chute*, Labiche's plays, Loti's *Pêcheur d'Islande*, Mignet's historical writings, Molière's *L'avare* and *Le bourgeois gentilhomme*, Racine's *Athalie*, *Andromaque*, and *Esther*, George Sand's plays and stories, Sandeau's *Mademoiselle de la Seiglière*, Scribe's plays, Thierry's *Récits des temps merovingiens*, Thiers's *L'expédition de Bonaparte en Egypte*, Vigny's *La canne de jonc*, Voltaire's historical writings.

GERMAN

a. Elementary (counting two units)

THE AIM OF THE INSTRUCTION.—At the end of the elementary course in German the pupil should be able to read at sight, and to translate, if called upon, by way of proving his ability to read, a passage of very easy dialogue or narrative prose, help being given upon unusual words and constructions, to put into German short English sentences taken from the language of everyday life or based upon the text given for translation, and to answer questions upon the rudiments of grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should

comprise: (1) careful drill upon pronunciation; (2) the memorizing and frequent repetition of easy colloquial sentences; (3) drill upon the rudiments of grammar—that is, upon the inflection of the articles, of such nouns as belong to the language of everyday life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word order; (4) abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (5) the reading of from 75 to 100 pages of graduated texts from a reader, with constant practice in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English), and in the reproduction from memory of sentences previously read.

During the second year the work should comprise: (1) the reading of from 150 to 200 pages of literature in the form of easy stories and plays; (2) accompanying practice, as before, in the translation into German of easy variations upon the matter read, and also in the off-hand reproduction, sometimes orally and sometimes in writing, of the substance of short and easy selected passages; (3) continued drill upon the rudiments of the grammar, directed to the ends of enabling the pupil, first, to use his knowledge with facility in the formation of sentences, and, secondly, to state his knowledge correctly in the technical language of grammar.

Stories suitable for the elementary course can be selected from the following list: Andersen's *Märchen* and *Bilderbuch ohne Bilder*; Arnold's *Fritz auf Ferien*; Baumbach's *Die Nonna* and *Der Schweigersohn*; Gerstäcker's *Germelshausen*; Heyse's *L'Arrabbiata*, *Das Mädchen von Treppi*, and *Anfang und Ende*; Hillern's *Höher als die Kirche*; Jensen's *Die braune Erica*; Leander's *Träumereien* and *Kleine Geschichten*; Seidel's *Märchen*; Stökl's *Unter dem Christbaum*; Storm's *Immensee* and *Geschichten aus der Tonne*; Zschokke's *Der zerbrochene Krug*.

Among the shorter plays the best available are perhaps Benedix's *Der Prozess*, *Der Weiberfeind*, and *Günstige Vorzeichen*; Elz's *Er ist nicht eifersüchtig*; Wichert's *An der Majorsecke*; Wilhelmi's *Einer muss heiraten*. It is recommended, however, that not more than one of these plays be read. The narrative style should predominate. A good selection of reading matter for the second year would be Andersen's *Märchen*, or *Bilderbuch*, or Leander's *Träumereien*, to the extent of, say, forty pages. After that such a story as *Das kalte Herz*, or *Der zerbrochene Krug*; then *Höher als die Kirche*, or *Immensee*; next a good story by Heyse, Baumbach, or Seidel; lastly, *Der Prozess*.

b. Intermediate (counting one unit)

THE AIM OF THE INSTRUCTION.—At the end of the intermediate course the pupil should be able to read at sight German prose of

ordinary difficulty, whether recent or classical; to put into German a connected passage of simple English, paraphrased from a given text in German; to answer any grammatical questions relating to usual forms and essential principles of the language, including syntax and word-formation; and to translate and explain (so far as explanation may be necessary) a passage of classical literature taken from some text previously studied.

THE WORK TO BE DONE.—The work should comprise, in addition to the elementary course, the reading of about 400 pages of moderately difficult prose and poetry, with constant practice in giving, sometimes orally and sometimes in writing, paraphrases, abstracts, or reproductions from memory of selected portions of the matter read; also grammatical drill upon the less usual strong verbs, the use of articles, cases, auxiliaries of all kinds, tenses, and modes (with special reference to the infinitive and subjunctive), and likewise upon word-order and word-formation.

The intermediate course is supposed to be the elementary course plus one year's work at the rate of not less than four recitations a week. Suitable reading matter for the third year can be selected from such works as the following: Ebner-Eschenbach's *Die Freiherren von Gemperlein*; Freytag's *Die Journalisten* and *Bilder aus der deutschen Vergangenheit*—for example, *Karl der Grosse*, *Aus den Kreuzzügen*, *Doktor Luther*, *Aus dem Staat Friedrichs des Grossen*; Fouqué's *Undine*; Gerstäcker's *Irrefahrten*; Goethe's *Hermann und Dorothea* and *Iphigenie*; Heine's poems and *Reisebilder*; Hoffmann's *Historische Erzählungen*; Lessing's *Minna von Barnhelm*; Meyer's *Gustav Adolfs Page*; Moser's *Der Bibliothekar*; Riehl's *Novellen*—for example, *Burg Neideck*, *Der Fluch der Schönheit*, *Der stumme Ratsherr*, *Das Spielmannskind*; Rosegger's *Waldheimat*; Schiller's *Der Neffe als Onkel*, *Der Gersterseher*, *Wilhelm Tell*, *Die Jungfrau von Orleans*, *Das Lied von der Glocke*, *Balladen*; Scheffel's *Der Trompeter von Säckingen*; Uhland's poems; Wildenbruch's *Das edle Blut*.

GREEK

Elementary (counting three units)

a. i. Grammar.

The common forms, idioms, and constructions, and the general grammatical principles of Attic Greek prose.

ii. Elementary Prose Composition.

Translation into Greek of detached sentences to test the candidate's knowledge of grammatical constructions.

The examination in the two subjects immediately preceding will be based on the first two books of Xenophon's *Anabasis*.

Both parts of Greek a must be passed at one and the same examination.

b. Xenophon.

The first four books of the *Anabasis*.

c. Homer.

The first three books of the *Iliad* (omitting II, 494-end) and

the constructions, poetical forms, and prosody of Homer's Iliad.

f. Prose Composition.

Translation into Greek of continuous prose based on Xenophon and other Attic prose of similar difficulty.

g. Sight Translation.

Translation into English at sight, based on prose of no greater difficulty than Xenophon's *Anabasis*.

Advanced (counting one unit)

Candidates offering Advanced Greek will be required to have covered substantially the same ground as that included under Greek 3-4 (see courses announced by the Division of Classical Philology). In Homer, for which no equivalent will ordinarily be accepted, the minimum requirement will be 1200 lines in addition to the amount offered for the elementary examination. The candidate must also offer Herodotus, Book VI, and Plato's *Apology*, and in prose composition at least fifteen exercises in Spieker's Greek Prose Composition. If candidates wish to offer equivalents for any of the subjects named, they must designate them when they apply for examination in this subject.

HISTORY

Elementary

NOTE.—Each of the four divisions, *a*, *b*, *c*, and *d*, counts one unit. Candidates for admission to the Schools of Mines, Engineering, and Chemistry may offer one or more of the divisions without restriction. All other candidates may offer any one or any two of the divisions without restriction.

- a.* Ancient history, including a brief introductory study of the Oriental peoples, and early mediæval history to the death of Charlemagne, with due reference to art, literature, and government.
- b.* Mediæval and modern history, from the death of Charlemagne to the present time, with due reference to the growth of the state-system.
- c.* English history, with due reference to social and political development.
- d.* American history, with the elements of civil government.

On examination a candidate must show such general knowledge of the subjects in each division offered as may be acquired from the study of an accurate text-book of not less than three hundred pages. Since *the questions will be so framed as to require comparison and the use of judgment rather than mere exercise of memory on the part of the pupil*, it is recommended that the teacher prescribe a course of supplementary reading of not less than three hundred pages dealing with the more important periods and events in each division offered. Geographical knowledge will

be tested by requiring the location of places, boundaries, and movements on an outline map.

Advanced (counting one unit)

Candidates offering Advanced History will be required to have performed work of the same kind, amount, and quality as that required for History A1-A2—the course prescribed in Columbia College (see courses given by Department of History). The work done at school therefore, should be substantially identical with that course, the nature of which is explained in a syllabus that may be obtained at the University Bookstore. Those candidates who desire to offer history as an advanced subject must have offered for elementary history either *a and b* or *c and d*, and must present themselves for examination upon the two divisions *which they did not offer as an elementary subject*. The examination will presuppose superior ability on the part of the candidate to understand the significance of historical events, movements, or tendencies, to discern similarities and contrasts, and to combine results. Especial care should be exercised, therefore, in the selection of the supplementary reading on the more important periods and events in each of the two divisions.

As further evidence of proficiency, satisfactory written work must be presented in the form of a note-book, or bound collection of notes (see Submission of Note-books, page 24), which must contain not less than five thousand words on each division offered, and must show practice in at least three of the following exercises:

- (a) Notes and digests of reading outside of the text-books.
- (b) Written recitations requiring the use of judgment, and the application to new questions of knowledge already gained.
- (c) Written parallels between historical characters, events, or periods.
- (d) Brief studies of topics limited in scope, prepared outside the class-room and illustrated by some reference to contemporary material.
- (e) Historical maps or charts showing explorations, migrations, conquests, territorial changes, or social phenomena.

ITALIAN

Elementary (counting two units)

THE AIM OF THE INSTRUCTION.—At the end of the course the pupil should be able to pronounce Italian accurately, to read at sight easy Italian prose, to put into Italian simple English sentences taken from the language of everyday life, or based upon a portion of the Italian text read, and to answer correctly questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the conjugation of the regular and the more common ir-

regular verbs, the inflection of nouns, adjectives, and pronouns, and the elementary rules of syntax; (3) abundant exercises illustrating the principles of grammar; (4) the reading and accurate rendering into good English of from 100 to 175 duodecimo pages of graduated texts, with translation into Italian of easy variations of the sentences read; (5) writing Italian from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of modern prose from different authors and of easy poetry; (2) practice in translating Italian into English, and English variations of the text into Italian; (3) continued study of the elements of grammar and of syntax; (4) mastery of all but the rare irregular verb-forms and of the simpler uses of the moods and tenses; (5) writing Italian from dictation.

Suitable texts for the second year are: E. DeAmicis' *Cuore*; G. Giacosa's *Acquazzone in montagna*; P. Zambri's *Il caporale di settimana*; G. Gozzi's *Poesie e prosce*, scelte da A. Pippi; B. C. Abba's *Da Quarto al Volturino*; Guido Zalorsi's *Guardare e pensare*; S. Zarira's *Il Signor Io*; A. Stoppani's *Il bel paese*.

LATIN

For old requirements alternative to these in 1911 and in January, 1912,
see page 49

NEW REQUIREMENTS IN ELEMENTARY LATIN!

At the entrance examinations to be held in June and September, 1911, and in January, 1912, candidates for admission may offer either the old requirements, or the new requirements as defined below. But only the new requirements may be offered at the examinations to be held in June, 1912, and thereafter.

Elementary (counting four units)

NOTE.—To secure four units candidates must offer N R 4, N R 5, and N R 6, except candidates for admission to the College of Pharmacy, who may offer N R 3 as a substitute for either N R 4 or N R 5.

Candidates for admission to Columbia College (course leading to B.S. degree), or the College of Pharmacy, who are unable to offer the whole of Elementary Latin, will be permitted to offer two units from this subject. Such candidates must offer parts N R 1, N R 2 and N R 4 or N R 1, N R 2 and N R 5, except candidates for the College of Pharmacy who must offer N R 3, or N R 1, N R 2 with N R 4 or N R 5.

To secure two units candidates for admission to Barnard College (course leading to B.S. degree) or the Schools of Music and Design (courses leading to a certificate in Music or Design) must offer N R 1, N R 2 and either N R 4 or N R 5, and candidates for admission to the Schools of Mines, Engineering, and Chemistry, or the School of Architecture (course leading to a certificate in Architecture) must offer N R 3, or N R 1, N R 2 with either N R 4 or N R 5.

N R 1. Grammar.

The inflections; the simpler rules for composition and derivation of words; syntax of cases and verbs; structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse, and the subjunctive. It will presuppose the reading of the amount of prose indicated under N R 4.

N R 2. Elementary prose composition.

Translation into Latin of detached sentences and very easy continuous prose based upon Cæsar and Cicero.

Latin N R 1 and N R 2 is considered a single, indivisible subject.

N R 3. Second Year Latin. It will presuppose reading not less in amount than Cæsar, Gallic War, I-IV, selected by the schools from Cæsar (Gallic War and Civil War) and Nepos (Lives); but the passages set will be chosen with a view to sight translation. The paper will include easy grammatical questions and some simple composition. (See note above.)

N R 4. Cicero and sight translation of prose.

- i. Prescribed reading: the oration for the Manilian Law and the oration for Archias.
- ii. Sight translation of prose of no greater difficult than ordinary passages of Cicero's orations.

Candidates must deal satisfactorily with both these parts of the paper, or they will not receive credit for either part.

N R 5. Vergil and sight translation of poetry.

- i. Prescribed reading: Vergil's *Æneid* I, II, and either IV or VI at the option of the candidate, with questions on the subject-matter, literary and historical allusions, and prosody.
- ii. Sight translation of poetry of no greater difficulty than Vergil's *Æneid*.

Candidates must deal satisfactorily with both these parts of the paper, or they will not receive credit for either part.

N R 6. Advanced prose composition.

The examination will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range of ideas called for will be such as are common in the reading of the preparatory course of four years.

The foregoing requirements are in substance identical with those recommended for adoption by the American Philological Association at its annual meeting in December, 1909, viz:

I. Amount and Range of the Reading Required

- i. The Latin reading required of candidates for admission to college,

without regard to the prescription of particular authors and works, shall be not less *in amount* than Cæsar, Gallic War, I-IV; Cicero, the orations against Catiline, for the Manilian Law, and for Archias; Vergil, *Æneid*, I-VI.

2. The amount of reading specified above shall be selected by the schools from the following authors and works: Cæsar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters, and *De Senectute*) and Sallust (Catiline and Jugurthine War); Vergil (*Bucolics*, *Georgics* and *Æneid*) and Ovid (*Metamorphoses*, *Fasti*, and *Tristia*).

II. Subjects and Scope of the Examinations

1. *Translation at Sight.* Candidates will be examined in translation at sight of both prose and verse. The vocabulary, constructions, and range of ideas of the passages set will be suited to the preparation secured by the reading indicated above.

2. *Prescribed Reading.* Candidates will be examined also upon the following prescribed reading: Cicero, orations for the Manilian Law and for Archias, and Vergil, *Æneid*, I, II, and either IV or VI at the option of the candidate, with questions on subject-matter, literary and historical allusions, and prosody. Every paper in which passages from the prescribed reading are set for translation will also contain one or more passages for translation at sight; and candidates must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part.

3. *Grammar and Composition.* The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range of ideas called for in the examinations in composition will be such as are common in the reading of the year, or years, covered by the particular examination.

Advanced (counting one unit)

Candidates offering Advanced Latin will be required to have covered substantially the same ground as that included under Latin A1-A2 (see courses announced by the Division of Classical Philology). In Horace, for which no equivalent will ordinarily be accepted, the minimum requirement will be the first and third books of the Odes, with a satisfactory knowledge of the prosody. The candidate must also offer Livy, Book XXI entire and Book XXII, chapters 41-53 inclusive (or, for Barnard College, Vergil, Eclogues, and selections from Ovid), and in prose composition fifteen exercises from Part I and ten exercises from Part II of Gildersleeve and Lodge's Prose Composition. If candidates wish to offer equivalents for any of the subjects named, they must designate them when they apply for examination in this subject.

MATHEMATICS

Elementary (counting two and one-half units)

a. Elementary algebra.

- i. The four fundamental operations for rational algebraic expressions.

Factoring, determination of highest common factor and lowest common multiple by factoring.

Fractions; including complex fractions, ratio and proportion.

Linear equations, both numerical and literal, containing one or more unknown quantities.

Problems depending on linear equations.

Radicals, including the extraction of the square root of polynomials and of numbers.

Exponents, including the fractional and negative.

ii. Quadratic equations, both numerical and literal.

Simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations.

Problems depending upon quadratic equations.

The binomial theorem for positive integral exponents.

The formulas for the n th term and the sum of the terms of arithmetic and geometric progressions, with applications.

It is assumed that pupils will be required throughout the course to solve numerous problems which involve putting questions into equations. Some of these problems should be chosen from mensuration, from physics, and from commercial life. The use of graphical methods and illustrations, particularly in connection with the solution of equations, is also expected.

c. Plane geometry.

The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and [the measurement of angles; similar polygons; areas; regular polygons, and the measurement of the circle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of lines and plane surfaces.

Advanced (counting one-half, one or one and one-half units)

Candidates for admission to Columbia College may offer one or more of the following subjects, each of which is equivalent to one-half unit.

Candidates for admission to the Schools of Mines, Engineering, and Chemistry must offer Solid Geometry and Trigonometry, counting one unit in Advanced Mathematics.

b. Advanced algebra.

Permutations and combinations, limited to simple cases.
Complex numbers, with graphical representation of sums and differences.
Determinants, chiefly of the second, third, and fourth orders, including the use of minors and the solution of linear equations.
Numerical equations of higher degree, and so much of the theory of equations, with graphical methods, as is necessary for their treatment, including Descartes's rule of signs and Horner's method, but not Sturm's functions or multiple roots.

d. Solid geometry.

The usual theorems and constructions of good text-books; including the relations of planes and lines in space; the properties and measurements of prisms, pyramids, cylinders, and cones; the sphere and the spherical triangle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of surfaces and solids.

f. Plane trigonometry.

Definitions and relations of the six trigonometric functions as ratios; circular measurements of angles.

Proofs of principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, of the double angle and the half angle, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas.

Solution of trigonometric equations of a simple character.

Theory and use of logarithms (without the introduction of work involving infinite series).

The solution of right and oblique plane triangles, and practical applications.

MUSIC

NOTE.—A candidate for admission to Columbia College or Barnard College may offer either *a* or *b*. A candidate for admission to the School of Music (courses leading to a certificate in Music) may offer either *a* or *b* or both.

a. Musical Appreciation (counting one unit)

The candidate is expected to have :

(1) A general knowledge of the principal musical forms—song, classic

dance, fugue, sonata (all movements), symphony—and of their historical development:

(2) A general knowledge of the lives and environments of at least ten composers, including Bach, Mozart, Beethoven, Schubert, Chopin, and five of the following: Purcell, Handel, Gluck, Haydn, Cherubini, Weber, Rossini, Glinka, Mendelssohn, Schumann, Wagner, Verdi:

(3): Familiarity with certain designated works. The works set for 1911 are :

<i>Bach</i> :	Prelude I and Fugue I from Well-Tempered Clavichord. Gavotte from Sixth Violoncello Suite.
<i>Handel</i> :	Air with Variations ("The Harmonious Blacksmith").
<i>Haydn</i> :	Largo from String Quartet (op. 74, No. 3).
<i>Mozart</i> :	Overture to "The Magic Flute." Symphony in G Minor (entire).
<i>Beethoven</i> :	Sonata Pathétique (op. 13, entire). Larghetto from Second Symphony. Allegro con Brio from Fifth Symphony.
<i>Weber</i> :	Overture to "Der Freischütz."
<i>Schubert</i> :	Moment Musical in F Minor (op. 94, No. 3). Song, "The Erl-King." Song, "Hark, Hark, the Lark."
<i>Mendelssohn</i> :	Scherzo from "Midsummer Night's Dream." "Spinning Song" (op. 67, No. 4).
<i>Chopin</i> :	Polonaise (op. 40, No. 1). Nocturne (op. 37, No. 2).
<i>Schumann</i> :	"Aufschwung" (op. 21, No. 2). Song, "Im wunderschönen Monat Mai."
<i>Wagner</i> :	Overture to "Tannhäuser." Siegfried's Funeral March, from "Götterdämmerung."

In the examination in (3) the candidate will be expected to identify characteristic portions of the works set, when played by the examiner, and to give intelligent information concerning the form and character of the works themselves. The test will not require ability to perform nor to read from printed music.

[b. Harmony (counting one unit)]

The candidate should have acquired:

(1) The ability to harmonize, in four vocal parts, simple melodies of not fewer than eight measures, in soprano or in bass—these melodies will require a knowledge of triads and inversions, of diatonic seventh chords and inversions, in the major and minor modes; and of modulation, transient or complete, to nearly-related keys.

¹ The examination in (3) will be held only in September and January, and will be open only to candidates who have passed the examination in (1) and (2).

(2) Analytical knowledge of ninth chords, a non-harmonic tones, and altered chords (including augmented chords). [Students are encouraged to apply this knowledge in their harmonization.]

It is urgently recommended that systematic ear-training (as to interval, melody, and chord) be a part of the preparation for this examination. Simple exercises in harmonization at the pianoforte are recommended. The student will be expected to have a full knowledge of the rudiments of music, scales, intervals, and staff-notation, including the terms and expression-marks in common use.

Musical Performance (counting two units)

Candidates desiring to offer this subject should communicate with the School of Music to ascertain the scope of the work and to arrange for the necessary examination.

PHYSICS

Elementary (counting one unit)

The candidate should be familiar with the elementary principles of physics and some of their practical applications, and should be able to solve simple numerical problems.

The preparation of the candidate should include :

- a. The study of one of the standard text-books in use in secondary schools.
- b. Instruction by lecture table demonstrations in which the phenomena of physics are shown and the principles qualitatively illustrated.
- c. Individual laboratory work, comprising at least thirty exercises. A suitable selection of experiments may be made from the list published by the College Entrance Board.

(See also Submission of Note-books, page 24).

Physiography (counting one unit)

NOTE.—This is identical with the subject called Geography by the College Entrance Examination Board.

The candidate's preparation in physiography should include the study of one of the modern text-books by Davis, Tarr, Dryer, or Gilbert and Brigham, together with an approved laboratory and field course of at least forty exercises actually performed by the candidate. Each division of the subject should receive approximately the same proportion of attention in the laboratory as in the class work. It is suggested that the exercises be divided somewhat as follows: Earth as a Globe, 5; Ocean, 5; Atmosphere, 12; Land, 18. An indexed note-book containing the record of these exercises must be submitted. (See Submission of Note-books, page 24.)

Shopwork (counting one unit)

The candidate may offer any one of the following subjects :

- a.* Bench-Work and Turning.
- b.* Forging.
- c.* Machine Work.

The candidate should have received laboratory instruction amounting to at least 180 hours in the subject offered, and will be required to pass both a written and a laboratory examination. The written examination will deal with the use and structure of tools, the nature of the usual shop processes and methods of work, and the properties of the materials commonly used in construction. The laboratory examination will consist of a practical test in the use of tools. The working drawing of some piece of work will be given the candidate, and he will be expected to select his tools and carry through all processes necessary for a finished result. As evidence of technical skill, the models made at school may be presented. They must be accompanied by a certificate from the instructor stating that they are the pupil's own work.

The following indicates the scope of the examinations :

- a.* Bench-Work and Turning.

Skill in the use of the ordinary carpenter's tools will be required and ability to sketch and describe their parts. The candidate will be expected to know the correct steps to pursue in laying out and finishing a simple piece of work. He will also be called upon to make the common joints and splices and to represent them by sketches. He should also be able to recognize the common varieties of wood, and to indicate their relative strength, hardness, character of grain, and tendency to warp. Ability in straight and simple curved turning both in hard and soft woods will be required, as well as a knowledge of the various methods of holding work in the lathe.

- b.* Forging.

The candidate should have had practice in drawing, upsetting, forming, bending, and welding of iron and in forming, hardening, and tempering of steel. He should be able to describe the difference in appearance and in physical properties of wrought iron, soft steel, and tool steel, and state some of the uses to which each is put. He should be able to show the construction of the forge by sketches and indicate the proper handling of a piece in the fire.

- c.* Machine-Work.

The candidate should have had experience both in chipping and filing cast and wrought iron and steel, and in the simpler processes performed on small engine lathes, drills, planers, shapers, and milling machines. He should be able to describe the mechanical construction of such tools and the operation of the different parts. He should also be able to indicate the correct

methods of securing the pieces to be operated upon, and of adjusting the tool for a given result.

SPANISH (counting two units)

THE AIM OF THE INSTRUCTION.—At the end of the course the pupil should be able to pronounce Spanish accurately, to read at sight easy Spanish prose, to put into Spanish simple English sentences taken from the language of everyday life, or based upon a portion of the Spanish text read, and to answer questions on the rudiments of the grammar, as defined below.

THE WORK TO BE DONE.—During the first year the work should comprise: (1) careful drill in pronunciation; (2) the rudiments of grammar, including the conjugation of the regular and the more-common irregular verbs, the inflection of nouns, adjectives, and pronouns, and the elementary rules of syntax; (3) exercises containing illustrations of the principles of grammar; (4) the reading and accurate rendering into good English of from 100 to 175 duodecimo pages of graduated texts, with translation into Spanish of easy variations of the sentences read; (5) writing Spanish from dictation.

During the second year the work should comprise: (1) the reading of from 250 to 400 pages of modern prose from different authors; (2) practice in translating Spanish into English, and English variations of the text into Spanish; (3) continued study of the elements of grammar and syntax; (4) mastery of all but the rare irregular verb-forms and of the simpler uses of the moods and tenses; (5) writing Spanish from dictation.

Suitable texts for the second year are: Valera's *El pájaro verde*; Alarcón's *El Final de Norma*, *El capitán Veneno*; Valdés's *José*; Galdós's *Doña Perfecta*; *Marianela*; Padre Isla's version of *Gil Blas*; Carrion and Aza's *Zaragüeta*.

ZOOLOGY (counting one unit)

OUTLINE FOR THE ONE-UNIT OPTION IN ZOOLOGY.—The following outline includes the principles of zoölogy which are indispensable to a general survey of the science. It is planned for a full year's course. It is not intended to indicate order of study of the topics—this must be left to the teacher and the text-book.

I. The general natural history—including genera, external structure in relation to adaptations, life histories, geographical range, relations to other plants and animals, and economic relations—of common vertebrates and invertebrates so far as representatives of these groups are obtainable in the locality where the course is given. The types suggested are a mammal, bird, lizard, snake, turtle, newt, frog, dog-fish or shark, bony fish, clam, snail, starfish, earthworm, planarian, hydra, sea-anemone, paramaecium. In the case of arthropods, pupils should

become familiar with common crustaceans, spiders, myriapods, and insects representing at least five orders. Actual examination of common animals with reference to the above points should be supplemented by reading giving natural-history information.

It is not expected that there will be time for making extensive notebooks on the natural-history work; rather will the work in this line take the form of laboratory demonstrations. So far as time permits, drawings and notes should be made. The note-book mentioned below should contain at least drawings on the external structure of four animals not studied under Section 3, preferably two insects, a mollusk, and a second vertebrate.

2. The classification of animals into phyla and leading classes (except the modern subdivisions of the worms) and the great characteristics of the groups. In the case of insects and vertebrates the characteristics of the prominent orders. The teaching of classification should be by practical work so as to train the pupil to recognize animals and to point out the chief taxonomic characteristics. The meaning of species, genera, and larger groups should be developed by constructive practical work with representatives of insect or vertebrate orders.

3. The general plan of external and internal structure, not the anatomical minutiae, of one vertebrate (preferably frog or fish) in general comparison with the human body; an arthropod (preferably a decapod); an annelid (earthworm or *Nereis*); a coelenterate (hydroid, hydra, or sea-anemone); a protozoön (a ciliate, and amoeba when possible). In place of any of above types not locally available there may be substituted a second vertebrate, an insect, a mollusk, or an echinoderm. Tissues, the study of which is recommended as optional,¹ should be examined first with the unaided eye, in such a structure as a frog's leg, and then with a microscope demonstrate the relations of cells and intercellular substance in epithelium and cartilage; and, if possible, in other tissues. The functions of the chief tissues and their positions in the body of a vertebrate should be pointed out.

4. (a) The general physiology of above types, involving the essentials of digestion, absorption, circulation (respiration), cell-metabolism, secretion, excretion, and nervous functions. This should apply comparatively the essentials of elementary work in human physiology. Demonstrations and experiments, such as are suggested in high-school text-books on human physiology, should be introduced, or recalled if not previously well presented in elementary physiology, in connection with the discussion of the chief functions. As far as practicable structure and function should be studied together.

(b) Comparison of the general life-processes in animals and plants (in connection with botany if zoölogy is first studied).

5. The very general features of a sexual reproduction of a protozoön (preferably *Paramaecium*); alteration of generations in hydroids; reproduction and regenerations of *Hydra*; the very general external features of embryological development in a fish or frog; and (*optional*)

¹ Topics marked "optional" are regarded as desirable for the best high-school zoölogy, but will not be required in examinations.

the general cellular nature (not centrosomes and the like) of germ-cells, fertilization and cell-division in developing eggs should, as far as possible, be demonstrated and briefly described. Also, the most interesting features of development should be pointed out in the case of other animals studied.

6. The prominent evidences of relationship, suggesting evolution within such groups as the decapods, the insects, and the vertebrates, should be demonstrated. A few facts indicating the struggle for existence, adaptation to environment, variations of individuals, and man's selective influence should be pointed out; but the factors of evolution and the discussion of its theories should not be attempted.

7. (*Optional*) Some leading facts regarding the epoch-making discoveries of biological history and the careers of such eminent naturalists as Darwin, Huxley, Pasteur, and Agassiz should be presented.

The above outline of a course in general zoölogy should be developed on the basis of a course of laboratory study guided by definite directions. This should be supplemented by the careful reading of at least one modern elementary text-book in general zoölogy. At least two thirds of the time should be devoted to the practical studies of the laboratory. If good nature-studies have not preceded the course in high-school zoölogy, pupils should be encouraged to do supplementary work in the line of natural history. A note-book with carefully labelled outline drawings of the chief structures studied anatomically (Section 3), and the drawings mentioned under natural history (Section 1), and with notes on demonstrations and in explanation of drawings, with dates and an index, must be submitted. It will be graded as one third of the examination. (See Submission of Note-books, page 24.)

The subjects for which the State credentials are accepted and their value in Columbia entrance units are as follows:

TABLE OF EQUIVALENTS

	State Education Department counts	Columbia units
Botany (Advanced Botany).....	5	1
Chemistry.....	5	1
Drawing, including Advanced Drawing.....	6	1
English, four years.....	13	3
French, Elementary.....	10	2
" Intermediate.....	5	1
German, Elementary.....	10	2
" Intermediate.....	5	1
Greek :		
Grammar and Composition	4	1
Anabasis.....	3 {	
Advanced Composition.....	1 {	1
Homer.....	3 {	
Translation of Prose at Sight.....	1 {	1
History :		
Ancient.....	5	1
European.....	5	1
English.....	5	1
American.....	5	1
Italian.....	10	2
Latin :		
Grammar and Composition.....	4	1
Cæsar (see page 37).....	4	1
Cicero.....	4	1
Vergil.....	4	1
Advanced Prose Composition.....	1 {	
Sight Translation of Prose.....	1 {	1
Mathematics :		
Algebra.....	5	1
Intermediate Algebra.....	2	½
Plane Geometry.....	5	1
Solid Geometry.....	2	½
Plane Trigonometry.....	2	½
Advanced Algebra.....	2	½
Physics.....		
Physiography.....	5	1
Spanish.....	10	2
Zoölogy (Advanced Zoölogy)	5	1

LATIN

Old requirements alternative with the new requirements (page 37) in 1911 and in January, 1912

Elementary (counting four units)

NOTE.—To secure four units candidates must offer *a*, *c*, *d*, *l*, and *m* except candidates for admission to the College of Pharmacy, who may offer *b* (Cæsar) as a substitute for either *c* or *d*.

Candidates for admission to Columbia College (course leading to B.S. degree) or the College of Pharmacy, who are unable to offer the whole of Elementary Latin, will be permitted to offer two units from this subject. Such candidates must offer parts *a* and *c*, or *a* and *d*, except candidates for the College of Pharmacy, who must offer *a* and either *b* or *c* or *d*.

To secure two units candidates for admission to Barnard College (course leading to B.S. degree) or the Schools of Music and Design (courses leading to a certificate in Music or Design) must offer *a* and either *c* or *d*; and candidates for admission to the Schools of Mines, Engineering, and Chemistry, or the School of Architecture (course leading to a certificate in Architecture) must offer *a* and either *b* or *c* or *d*.

a. i. Grammar.

The inflections; the simpler rules for composition and derivation of words; syntax of cases and verbs; structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse, and the subjunctive.

ii. Elementary Prose Composition.

Translation into Latin of detached sentences and very easy continuous prose based upon Cæsar and Cicero.

Both parts of Latin a must be passed at one and the same examination.

b. Cæsar. (See Note above.)

Any four books of the Gallic War, preferably the first four.

c. Cicero.

Any six orations from the following list, but preferably the first six mentioned:

The four orations against Catiline, Archias, and the Manilian Law, Marcellus, Roscius, Milo, Sestius, Ligarius, the Fourteenth Philippic.

d. Vergil.

The first six books of the *Æneid*, and so much of prosody as relates to accent, versification in general, and the dactylic hexameter.

l. Prose Composition.

Translation into Latin of continuous prose of moderate difficulty based on Cicero.

m. Elementary Sight Translation.

Translation into English at sight, based exclusively on prose

of no greater difficulty than the easier parts of Cicero's orations.

CIRCULARS OF INFORMATION

For information as to tuition fees, scholarships, curriculum, and scheme of attendance, application should be made to the Secretary of the University for such circulars of information as are necessary. The following are distributed without charge:

Announcement of Columbia College

Announcement of Barnard College

Announcement of the College of Pharmacy

Announcement of the Schools of Mines, Engineering, and Chemistry

Announcement of the Schools of Fine Arts

For information upon any point not covered by the pamphlets, inquire of the Secretary of Columbia University.

Additional copies of this pamphlet may be obtained upon application. Instructors are requested to furnish the Secretary of the University, at as early a day as possible, with the names and addresses of students to whom the pamphlet should be sent.

UNIVERSITY OF ILLINOIS-URBANA



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